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BUSINESS · ENGINEERING · INDUSTRY · SCIENCE

JULY 1948

BANKING—TODAY, TOMORROW
— Report to Management — 49
Russian Industry for War 13
Rayon Yarn Spun from Tow 16
Locomotive Flues Cleaned Automatically 30
France—Prosperity Coming 37
Food Research Advances 46

AVIATION
Gives Low Vibration Level...23
Checks Gas Turbine.....25
Airfoil Fuselage Proven.....48
Also: 18, 19, 26, 32, 39, 40, 43, 47

CHEMISTRY
Reduces Cholesterol 41
Catalytic Gas Reforming.....47
New Petroleum Technology...48
Also: 9, 17, 27, 32, 35, 36, 38, 40

CONSTRUCTION
Floors Need Heat.....17
Steel Forms Speed Building..23
A New Concrete-Block House.48
Also: 9, 15, 32, 35, 39, 42, 43, 45

ELECTRICITY, POWER
Surface-Water Preparation...28
Hydro Costs Competitive....40
Improve Liquid Rheostats....47
Also: 18, 21, 22, 27, 34, 38, 39, 46

ELECTRONICS, RADIO
New Cosmic-Ray Theory.....17
Merchant-Marine Radio 23
Industrial Television.....38
Also: 20, 22, 27, 33, 35, 42, 45

FACTORY METHODS
3-Level Layout Ups Output...19
Easier Work.....21
Straight-Line Production.....26
Also: 18, 20, 28, 30, 34, 38, 39, 45

FOOD PROCESSING
Improves Frozen Foods.....19
Margarine Storage.....26
Retains High Food Quality...35
Also: 9, 28, 32, 34, 40, 43, 46, 47

MECHANICAL DESIGN
Artificial Hands Improved...25
Electronic Organ.....44
Aluminum-Housed Motor....45
Also: 18, 25, 35, 40, 42, 43, 47

METALWORKING
Magnesium Electroplated....15
Relative Wear Values.....23
Sonodizing Al Alloys.....26
Stops Self-Excited Chatter...48
Also: 18, 20, 22, 27, 34, 36, 38, 41

MINING
Coal Preparation, Storage...24
Speeds Shaft Lining.....26
Quonsets as Mine Portals....34
Also: 9, 18, 22, 25, 32, 33, 36, 44

TEXTILES
New Resin Cotton Finish.....18
Tensionless Processing.....22
Crepe Warping Bemberg....28
Also: 16, 25, 27, 32, 38, 42, 43, 44

TRANSPORTATION
Reduce Accident Rates 20%..19
Ford Rebuilding Overseas...20
Modern Bus Advertising.....29
Also: 9, 18, 27, 32, 33, 37, 44, 45

177 ITEMS IN THIS ISSUE

An International Review of New Developments

New Esso refineries are being built—many others are being expanded.

They Build an Answer

The world's demand for petroleum has reached an all-time high—and is still increasing! Today the need for petroleum is even greater than during the peak war year of 1945.

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New Bliss Presses for Nash Bodies

Bliss presses are rugged production equipment, easy to install, adjust and repair. That's why they're favored at Nash's Milwaukee body plant, as they have been ever since Nash first started building cars...why they predominate on practically every one of its stamping set-ups.

The majority of the presses in the Nash Body Plant are Bliss-Built. They range from a three-ton capacity bench press for riveting small sections to a battery of 500-ton fully enclosed presses recently installed for the production of side quarter panels.

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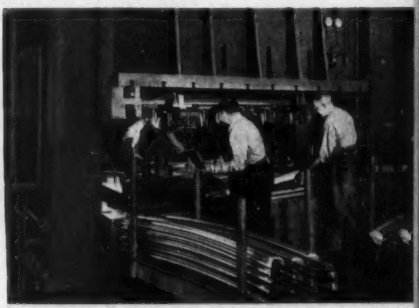
Export Division, 19 E. 47 St., New York 17, N. Y., U. S. A.

Mechanical and Hydraulic Presses, Rolling Mills, Container Machinery

WORKS AT: Toledo, Cleveland, Salem, Ohio; Hastings, Mich.; Englewood, N.J.; Derby, England; St. Ouen sur Seine, France.

Side quarter panels for Nash cars undergo a series of forming and trimming operations in this battery of Bliss enclosed single action presses. The presses in the foreground are 124" between uprights and deliver 500 tons pressure at bottom of stroke.



The wide and deep bed of this 500-ton Bliss enclosed press is utilized to full advantage in production of Nash running board aprons. Double dies are used to pierce five holes in each of two aprons with each stroke.

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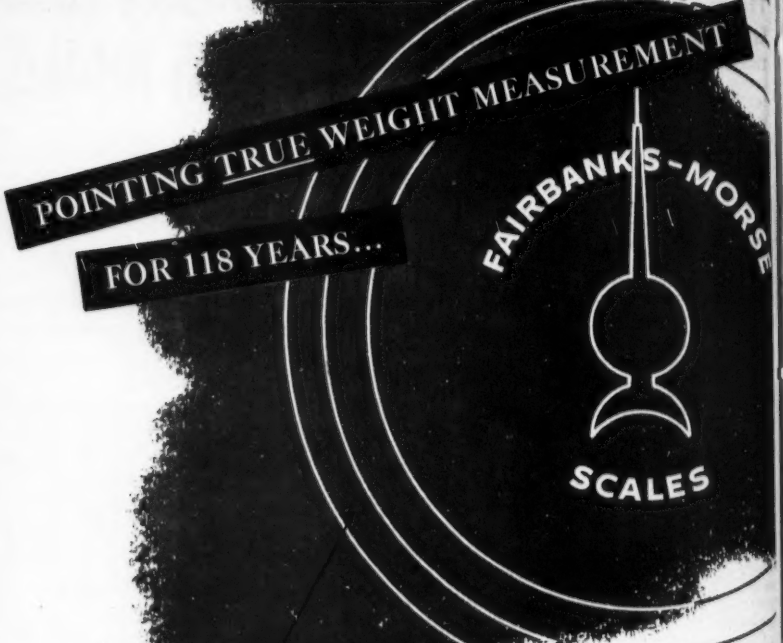

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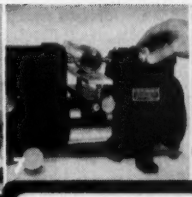
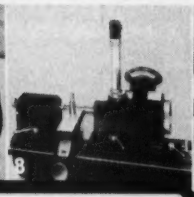

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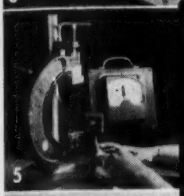
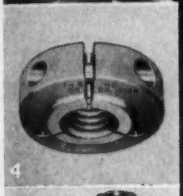
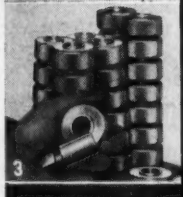
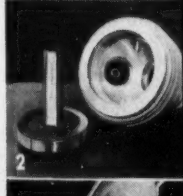

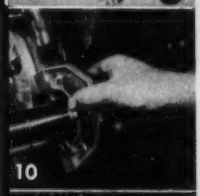

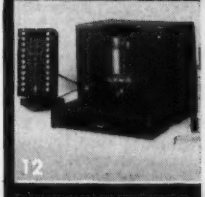

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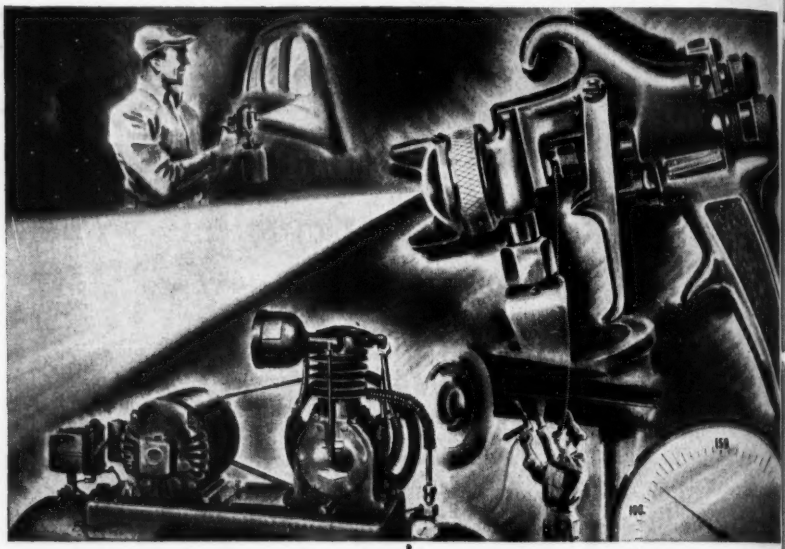

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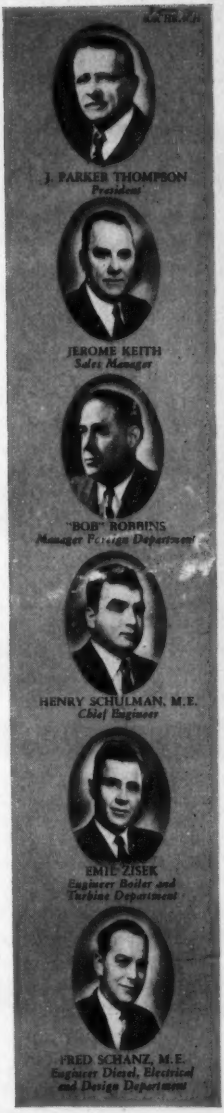

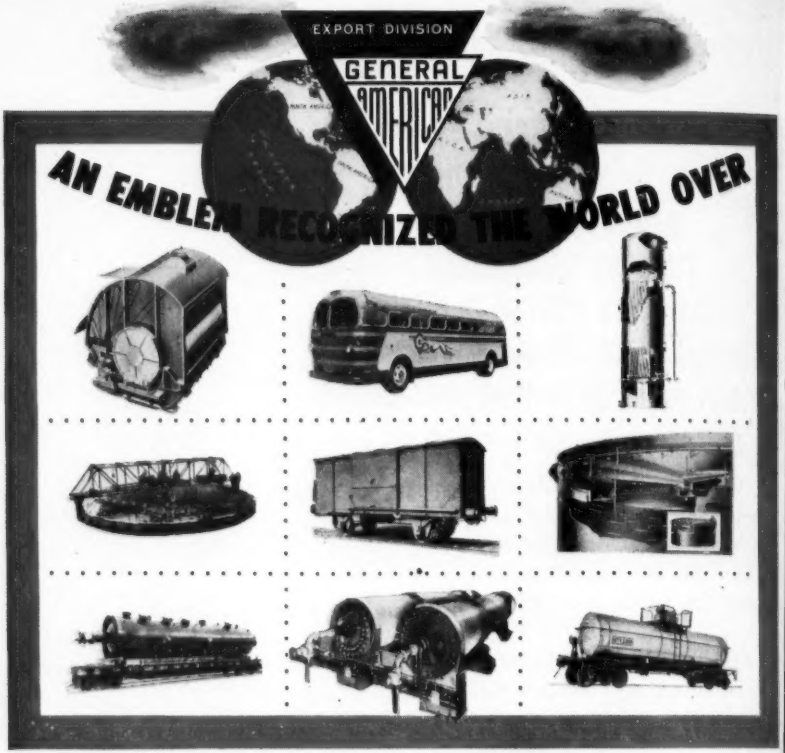

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TRADE MARK

BUSINESS TRENDS

World industrialization—construction and reconstruction—continues at a rapid pace. But some countries are giving twists to their programs that discourage international trade. Others are inviting foreign participation—in management and investment.

For one, **Mexico** has just completed its first electric refrigerators at Industria Electrica de Mexico, S. A. A joint Mexican-American company, it has practically a monopoly because of last year's import restrictions. Westinghouse Electric Corp. contributed the technical knowledge in engineering the Mexican plant.

Argentina too is aiming at greater self sufficiency, but in doing so many observers feel it is in danger of drying up the flow of essential capital from outside its borders. Policies adopted in foreign trade and finance by **President Peron's** economic czar, **Miguel Miranda,** have boosted export income. But also, they appear to have just about eliminated the peso as a hard currency and depleted dollar and gold reserves. Heavy U. S. purchases for the European Recovery Program are badly needed.

Canada is forging ahead on all lines. Its plastic industry is mushrooming. Dollar volume is running at seven times that of 1939. New Dow plant at Sarnia and Monsanto plant at Montreal make Canada an exporter of polystyrene. Also slated is a $2-million Bakelite plant at Belleville for vinyl resin plasticizers.

On the other side of the world, **Indonesia** is planning a $500-million reconstruction program. Needed are ships, mining and agricultural equipment, railroad equipment, oil-extraction equipment, vehicles, textiles. **Uganda,** with prospects of cheap power from Juja Dam project, plans wide variety of new industries—textiles, fertilizers, and copper and bauxite deposit development.

A 10-year plan for coal is on **Turkey's** program. Object: to raise output from 4.5-million tons a year to 9- to 11-million. Plans include a new plant to make 300,000 tons of coke per year from coal dust. U. S. technical assistance is expected. Power for development will come from the 60,000-kw. hydro-plant at Catalagzi. Western lignite mines at Tuncibilek, Soma, and Degirmisaz will be developed in first 5 years; those at Eregli in 10 years.

Plant expansion in **U. S.** should also reach a new high this year at $18.7-billion, compared with $16.2-billion in 1947. **Russia** too is pushing ahead (page 13), and **France** foresees prosperity with current production at 115% of 1938 (page 37).

U. S. oil industry looks ahead to a troubled year as estimated supply falls short of estimated needs. Forecast need is 6,465,000 bbl. daily to meet demand and provide minimum additions to oil stock. Forecast supply will average only

6,408,000 bbl. daily. Increase in domestic demand of 7.4% will be offset partially by a 7.1% drop in exports.

In 1948, for the first time in 25 years, U. S. expects to be a net importer of petroleum. Imports are expected to jump from 475,000 bbl. daily in first quarter of this year to 520,000 bbl. daily in first quarter of 1949.

Oil too holds attention in Germany. U. S.-British military governments have approved a 2-year program to rebuild enough capacity of Germany's war-blasted plants to meet needs of the combined zones. Program calls for processing of 2-million metric tons of crude oil annually plus production of 175,000 tons of lubricants, asphalt, and waxes. Program cost: $25-million a year. First step is a big repair job. This is another indication of the firm intentions of U. S. and Britain to make Germany self sufficient so she can take her part in the European economic system.

Food and farm equipment still are No. 1 interest-getters in most countries. Food situation (McG-H Digest, May, p. 8) still looks good and should continue so, barring adverse weather conditions.

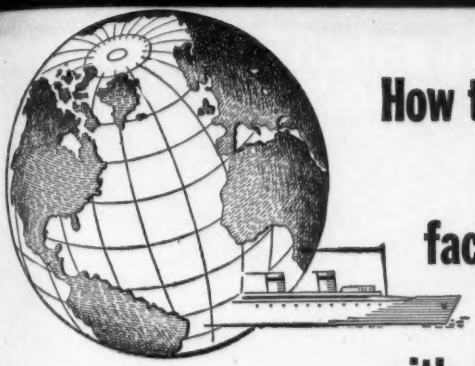
Farm-equipment picture is less promising. Despite record U. S. production in 1947 and for first quarter of 1948, shortages continue. Most acute are in tractors, combines, cornpickers, haybalers. Less acute shortages include harrows, disks, cultivators, drills. Some dairy equipment has caught up with demand, can be had "over the counter." Delivery time on most U. S. farm tools now runs from 30 days to 2 years. High production rates should be necessary well into 1949, before manufacturers can meet both domestic and export demand.

U. S. metalworking equipment exports are slowly rising, according to U. S. Department of Commerce. From a high of $54.6-million in second quarter of 1947, they dropped to $44.5-million in the third quarter and recovered to $48.1-million in the last quarter. Following a sharp drop in Dec. 1947 and Jan. 1948, they are again on the way up. ECA commitments will govern their action the remainder of this year—and maybe a lot longer.

Rubber is again to the front in international trading. Prices will prove more stable than had been expected, according to experts' conclusion drawn from recent Washington meeting of the Rubber Study group. Supply will exceed demand, except for U. S. stockpiling. U. S. buying will support prices. But U. S. is unlikely to pay the 26½c per lb. Britain wants for 900,000 tons of natural crude it holds, even though military program calls for stockpiling.

All foreign businessmen and executives are affected, at one time or another, with banking conditions and practices in the U. S. To explain how the U. S. banking system operates as a private enterprise in a free economy, the editors bring you, in this issue, a special report, Banking—Today, Tomorrow (page 49).

Items on these pages come from McGraw-Hill magazines and news services.



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SOVIET WORKERS are an important cog in preparing . . .

Russian Industry for War

U. S. S. R. not ready for war today but her industrial potential is pointed to 1960. Consumer goods are lagging behind needs

RUSSIAN INDUSTRY is not ready for war today. But it is geared for war at the expense of consumer goods. By 1960 she will have built up an industrial potential capable of waging war.

[*Editors' Note: This article is a digest of an article written by Robert Magidoff, McGraw-Hill World News' Moscow correspondent, just expelled from Moscow after 12 yr. in the U. S. S. R.*]

Based on current U. S. production, Russia's industrial output is running at 25%. But she is producing several times the weapons for war that the U. S. is turning out. There is some evidence that sacrificing of consumer goods is creating a weakness in U. S. S. R. economy, but this must not be construed to indicate a lack of war production.

Last year Russia produced 18,000,000 tons of steel and about 50,000,000 kw-hr. of electric power. Her current plant and equipment building program will increase these several-fold by 1960.

Russia's production must be gaged against that of the U. S. and Western Europe as of 1940. In '40, Russian output was about one-third that of Western Europe, and those countries about equaled U. S. production. Mr. Molotov's 1947 industrial report showed her production had barely regained its 1940 position. Western Europe's output is off

BOX SCORE OF INDUSTRIAL PRODUCTION

		STEEL (Millions of Tons)	COAL (Millions of Tons)	GRAINS	ELECTRIC POWER (Billions of Kilowatt Hours)	TEXTILES (Billions of Yards)	POPULATION (Millions)
U.S.A.	1940	67	503	121	145	10.5	132
	1947	85	658	151	255	11.5	145
	1950	90	650	165	285	12.0	151
WESTERN EUROPE	1940	60	607	71	140	10.0	261
	1947	34	483	54	170	6.3	270
	1951	61	642	72	222	10.1	290
U.S.S.R.	1940	20	183	118	48	4.1	193
	1947	18	196	100	54	2.6	197
	1950	28	275	126	82	4.8	205
EASTERN EUROPE	1940	5	90	75	17	1.8	121
	1947	FIGURES NOT AVAILABLE					
	1950						

one-fourth—about at the '40 level. U. S. production is up 50% above that level.

Figured on per-man productivity, Russian workers are producing about one-sixth the amount per day produced by an American worker.

World War II devastated half of Russia's industry. Many of the plants being rebuilt have been moved east of the Ural Mts. The fourth Five-Year Plan was started in 1946, over two-thirds of building being heavy industry but plan called for expansion of light industries.

The steel goal of 25,000,000 tons is 75% over 1945 output, 40% over prewar. The 250,000,000 tons of coal will be two-thirds above 1946, 50% greater than prewar. Cars and trucks will rise from 150,000 in 1940 to 500,000 in 1950. Metallurgical-equipment output will rise to 103,000 tons in 1950 from 28,000 in 1940.

The cotton-textile goal for 1950 is set 10% above 1940, but is 190% above 1945. Shoe production in '50 will be 4 above 1940 and 300% above 1945.

These existing consumer-goods shor ages have an adverse effect on work morale. Labor turnover is high—on Moscow metalworking plant report 100% turnover in 9 mo. The recent ec nomic reforms were designed to counte act bad worker morale.

There is no labor shortage. The labo force was restored in numbers by 194 but many women and young boys an girls have replaced skilled male worker Trade schools are operated to teach in dustrial skills to boys and girls.

Two strong points in Russia's econom include the recovery of coal productio to above prewar levels. Imports fro Poland have been cut. Centralization o industry behind the Urals is an advan age defensively. By 1950 half her co and steel production will come from th east.—Factory, May, 64

Magnesium Parts Electroplated

Long considered impossible because of nickel attack on magnesium and galvanic corrosion, plating is made possible with zinc film applied by dipping

ELECTROPLATING of magnesium is now successful after twenty-five years of research. The new process, developed by Dow Chemical Co., will apply chromium, nickel, copper, brass, cadmium, zinc, gold, and silver.

Good adherence is obtained. Copper-plated work can be soldered, while chromium plate as much as 0.0005 in. thick shows no flaking. When a break occurs in a film under corrosion tests, there is little tendency to spread.

First step in the process is cleaning to remove scale, oxide, grease, and any chemical coatings. After polishing, buffing, or burnishing, the magnesium part is solvent-cleaned or degreased, and rinsed.

Next step is cathodic cleaning at 180–212° F., 6 volts, and 40 amp. per sq. ft. Bath is mixture of trisodium phosphate, sodium carbonate, and sodium-hydroxide. This is followed by a rinse and a bright chromic-acid dip of chromic, nitric and hydrafluoric acids at room temperature.

Cold-water rinse follows, then a dip in 15% hydrofluoric acid to remove any chromium compounds on the surface.

Following another rinse, parts are pickled in a 20% aluminum-chloride solution, rinsed, and then zinc-coated by dipping. Solution is tetrasodium pyrophosphate, zinc sulphate, and potassium fluoride plus potassium carbonate to bring pH to 10.2-10.4. Immersion time is critical, varying for different alloys.

Parts are immediately given a copper striking in a copper cyanide-Rochelle salt bath, rinsed, and copper plated. This is followed by nickel and chromium plating for most articles. Buffing may be desirable after either copper or nickel plating. If so, cleaning and pickling must be repeated before applying the next coat.

Cadmium and zinc can be applied directly after the copper strike. Brass can be plated on over the zinc-immersion coating or after the copper striking. Silver and gold can follow directly after the copper strike, but preferably follow a nickel strike.

Smoother plate on sand and permanent-mold castings is possible if they are first given a solution heat treatment. Pressure die castings should not be solution treated.—Am Mach, May 6, 98

CONCRETE ROOF FOR ROUNDHOUSE

This curved reinforced-concrete Bethune, France, roundhouse is only 3¼ in. thick. Shell is stiffened radially by hollow ribs, which also duct smoke to outside. It is supported on 3 concentric rings of concrete columns. The cast-in-place roof is 115 ft. wide. — Eng News-Rec, May 20, 16

Rayon Yarn Spun from Tow

New Saco-Lowell machine produces a yarn with rayon's sheen and cotton's fuzziness. Yarn is being produced experimentally with good result

NEW RAYON YARNS are being spun from tow on a new frame developed by Saco-Lowell Shops. Yarn has a characteristic fuzziness that is more noticeable than that of cotton; it has the characteristic sheen of rayons; it does not imitate any existing yarn. Mills testing the new yarn report that it will supplement rather than replace existing yarns.

Counts from 20s to 80s have been spun experimentally directly from tow. The process produces the yarn in one operation, eliminating opening, picking, carding, drawing, roving, and conventional spinning operations. Tow is broken by drafting into fibers of various lengths and is twisted and wound by conventional ring and traveler.

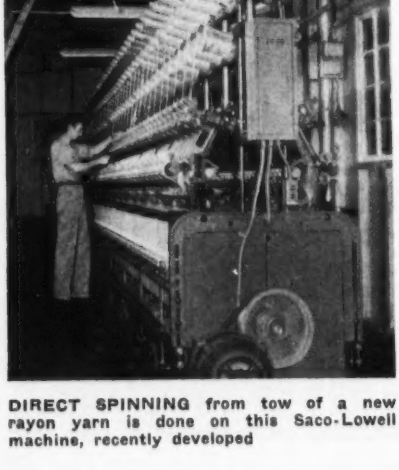
Characteristics of the yarn are not known completely at the moment, but ex-

TOW TRAVELS around tension guide passes over 2-in. synthetic-rubber top rol and into bite of that roll and bottom steel fluted roll

perimenting mills report that on Draper standards direct-spun yarn breaks a almost twice the figure for equivalen yarn. Contraction is high. Knitte into socks, shrinkage is considerable.

During twisting and weaving, more contraction was noted than on conventionally spun yarns. One mill is spinning 20s to 50s from 4400-den., 1½-dia. filament tow and reports breaking strength about 30% and elongation 55% lower than equivalent count spun-rayon yarns.

The direct spinner has 102 spindles per side and 2 start-stop switches. To reverse twist, motor direction is reversed and head end of frame is adjusted so feed and delivery rolls run in proper direction. Bobbins are tip driven from wooden-sleeve spindles. Piecing an en



DIRECT SPINNING from tow of a new rayon yarn is done on this Saco-Lowell machine, recently developed

on direct spinner varies from standard, in that operator picks up loose tow after he has threaded traveler and guide wire, pulls tow away from bite of delivery roll, and twists end in piece-up.

Five counts are being spun directly from tow on rings larger than standard for cotton-type ring spinning.

One mill ran 19.2 hr. before doffing. The 5-lb. tow creeled in the machine ran 7.6 days on a 2-shift operation before recreeling. The 4400-den. tow costs about 55¢ per lb.—Textile World, May, 114

Customs Union Will Aid French-Italian Chemicals

Chemical industries of France and Italy will benefit from growth of cooperation, as the two countries' economies become more closely interlocked. Here is what is expected to happen in various fields.

In soda, Italy is unlikely to enter export field extensively, but France plans to raise exports of carbonate to 240,000 tons by 1952 and caustic soda to 120,000 tons.

Italy should meet own needs of phosphate fertilizers, while France will continue reduced exports. Plans call for 30–40% increase in production. Nitrate-fertilizer output is planned to meet their own needs by 1952. French expect boost of nearly 100%, while Italy, planning to triple output, will be able to ship 75,000 tons a yr. to France.

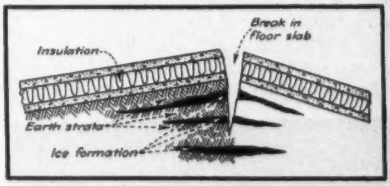
Sulphuric-acid production is up in both countries, 1,000,000 tons in France and 650,000 tons in Italy last year. Each expects an 800,000-ton increase in next few years to meet own needs. Dye and colorant output is now greater in Italy; semi-finished exports may flow to France under the customs union.

In all fields, a concentrated, domestic market of nearly 100-million people (including North Africa) will mean lower production costs and better export prospects.—Chem Eng, May, 226

New Cosmic-Ray Theory

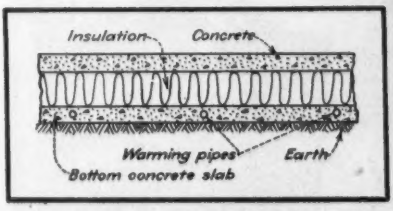
Cosmic rays are ionized particles known to exist throughout space and accelerated by transient electric fields associated with solar radiation of extremely low frequency. The new theory postulates that the sun is continually radiating a sort of thermal-noise spectrum, whose Fourier-analysis components range from 200 to 2,000,000 mi. in wavelength.

Thus provided would be a simple mechanism for concentrating energies of many particles of the solar atmosphere on a single particle in space. The earth then would be rushing through a tenuous jitter of accelerated and decelerated ions, which are identified as primary components of cosmic radiation.—Nucleonics, Ap, 67



FLOORS NEED HEAT

BEFORE—Usual design of freezing-room floor consists of two concrete slabs separated by a thick layer of insulation. Freezing temperature in the ground causes ice to form in solid layers that raise and rupture floor slabs.



AFTER—Permanent solution is neither thicker insulation nor drainage, although both will delay floor failure. Warming pipes (45°F.) in the lower slab add enough heat to keep ice from forming under the concrete. —Power, May, 91

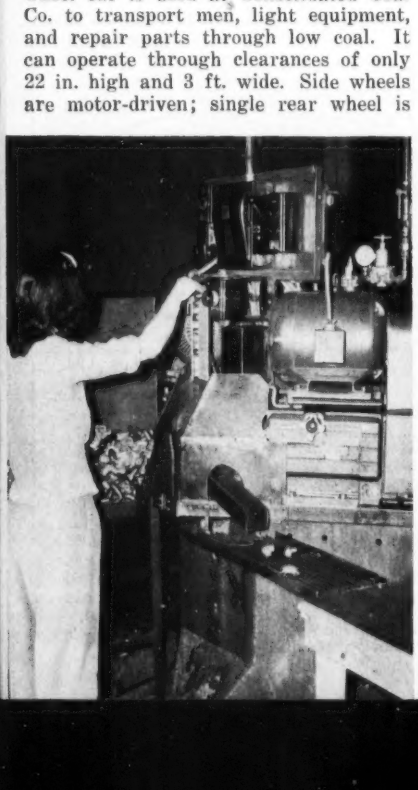
Oldsmobile Soon to Use High Compression Engines

The 1949 Oldsmobile will be powered by an engine of much higher compression ratio than any spark-ignition engine previously used in automobiles. Initially, engines will have an 8:1 ratio, later a 12.5:1. Tests have been conducted on a 6-cylinder engine with a 3⅜-in. bore and stroke.

Engine is similar in design to those of lower compression ratio, but is built more sturdily. It has seven bearings instead of four supporting crankshaft load. —Am Auto, May, 45

Tracks in Low Coal

Powered by a 1½-hp. electric motor, a 3-wheel car is used at Consolidated Coal Co. to transport men, light equipment, and repair parts through low coal. It can operate through clearances of only 22 in. high and 3 ft. wide. Side wheels are motor-driven; single rear wheel is turned by steering wheel at front. Operator lies on his stomach and operates brake with his right toe.—Coal Age, May, 126



Measures Rocket Exhaust Temperatures

The absorption-emission pyrometer, developed by North American Aviation, Inc., reads and records on oscillograph paper flame temperatures from 1500 to 4000° F. Operation is based on comparative brilliance of two light beams from a tungsten strip lamp, one beam passing through the flame.

Varying the brightness of the lamp brings both beams to same brightness, so true temperature of flame is equal to brightness temperature of lamp at that point.

Advantages over sodium D-line reversal temperature method are safety to operator, as no sodium salt need be added to the flame, and temperature changes can be followed closely. Accuracy with thin flames and with those containing small amounts of soot is within 1%.—Prod Eng, May, 150

New Resin Cotton Finish

Superset, American Cyanamid Co.'s new resin-based finish for cotton, makes cloth wrinkle-resistant. It can be applied easily to all cottons; any mill can apply it without extra equipment. There is no loss of strength, shrinkage is negligible. Application costs are not more than 10¢ per yd.—Business Wk, May 8, 48

BETTER WORK HANDLING

Production of brass fittings at Keystone Brass Works has been speeded up by novel works-handling methods. Elbows are bored by two 1½-hp. Ex-Cell-O units with hydraulic boring heads mounted at right angles to each other. Elbows, hopper fed to operator, are loaded in a vertical slot leading to machining position. Operator needs only to keep slot filled. Bored elbows are gravity fed to inspection.—Am Mach, May 20, 96

LIGHT TRANSPORT

Ready for flight tests is Aero Design & Engineering Corp.'s light transport "Aero Commander." Seating seven, it has a useful weight of 2,300 lb. Two 200-hp. Lycoming engines give plane a cruising speed of 165 mph. Wing span is 43 ft.; length is 32 ft.—Aviation Wk, Ap 26, 41

3-Level Layout Raises G. E. Production 65%

Unused headroom was converted to production areas at General Electric's refrigeration unit plant when the company needed more production area. Output was increased 65% without adding to the cubic footage of the plant. After careful study, engineers determined that only preliminary and final assembly operations would not be performed "in the air."

Space over pump assembly area was converted to a balcony for parts storage and pump assembly. An overhead conveyor through the wall transports parts from the machine shop. After inspection, parts pass to assembly area below. Parts for main assembly are also handled from the balcony.

Area above drying ovens is used for cooling conveyors just prior to inspection. Operator fatigue has been reduced greatly and more women can now be employed.—Factory, May, 116

Accident Rate Reduced 20%

New York's Third Ave. Transit Corp. has reduced its preventable accident rate 20% since it instituted a safety program in August 1947. A survey of former accidents showed that one-third of all preventable accidents were caused by 181 of the 2,100 drivers of the company's 1,400 buses and street cars.

With union agreement, rules adopted call for the suspension of a driver involved in three preventable accidents in a 6-mo. period. After the first accident, the driver meets with a union representative, the superintendent of operations, and the safety department. Suggestions are made to improve his safety record.

After the second accident, the driver spends 1½ days on road-check tests and also spends ½ a day seeing safety films and taking safety exams. Exam is studied by driver and a member of the safety department. A third accident brings dismissal.—Bus Trans, May, 76

Improves Frozen Foods

Direct microscopic count during food processing will reveal contaminations and permit corrective measures before serious trouble develops. Results are obtained in 20–30 min., showing the food processor where contamination is taking place.

Fish products, for one, may be improved by better handling methods aboard boats to reduce bacteria action. Poultry too may deteriorate prior to freezing. The new hot evisceration helps eliminate flavor changes.

Fruits and vegetables may be improved by potential electronic blanching before freezing. Exposure to radar irradiation, also X-rays and cathode rays, reduces microorganisms to a minimum. These methods, before production-line use, still require further research.—Food Ind, May, 76

Ford Rebuilding Overseas; Announces New Passenger Bus

Ford Motor Co.'s European operation is being rebuilt; plans for new management methods, modernized models, and increased exports are being pushed. Exportation of U. S.-made Fords will be difficult so long as the world-wide shortage of dollars exists. English, French, and German plants should fare better in the dollar-short market. Such exports would assist the manufacturing countries.

The Poissy, France, plant will produce a 66-hp., V-8 car with a 105-in. wheelbase. It will be displayed at fall automotive shows on the Continent. The Dagenham, England, plant, largest of the European operations, will be completely redesigned. In 1947 the plant produced 107,399 units. The Cologne Germany, plant has been rebuilt and is being operated under supervision of Ford in the British zone. Production will focus on trucks.—Am Auto, May, 62

Ford has just announced a 27-29 passenger motor bus, powered by a 104-hp. engine. Wheelbase is 146-in.; overall length, 26 ft. Engine block is mounted at the rear on a steel plate, separating block from the clutch housing.—Bus Trans, May, 84

Small Plants Gain Big-Plant Economies

Successful operation for 16 yr. of a nonprofit, cooperative manufacturing facility by competitive companies shows how small plants can reduce manufacturing costs.

Three companies in Denver own shares in the General Iron Works which handles all their manufacturing. Allocation of machine loading is done according to percentage interest of the parent companies.

Orders are received the same as any job shop would get them from customers, but with one difference. They are accompanied by analysis sheets that break down and time necessary operations. From these orders, parent-company representatives allocate, in monthly meetings, the loadings on various shops and machines.

Advantages include lower production costs, sharing of overhead, and more equipment available than would be the case if each company did its own manufacturing.—Am Mach, May 20, 94

Semi-Automatic Welder

Hidden arc welding using deep flux is now possible on jobs inaccessible for automatic welding. A new portable unit provides welding current and auxiliary power plus automatic wire feed. The standard 600-amp. welder can be used for manual welding as well as semi-automatic welding.

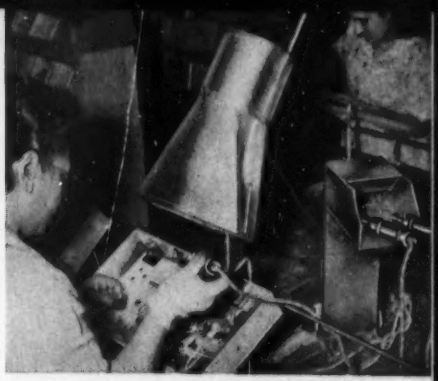
Aluminum, cone-shaped gun holds 3½ lb. of flux. Gun is joined by detachable coupling to a special coupling running to feed mechanism and carries both wire and current. Arc starts when electrode touches work; wire is automatically fed at proper rate for current used. Unit is a development of Lincoln Electric Co.—Business Wk, May 15, 78

Electronic Lightning Alarm

A device developed in South Africa warns of the approach of thunderstorms. It provides two degrees of warning: (1) that lightning flashes have occured within a radius of either 7 or 20 miles, depending on the setting of a near-far switch, or (2) that a flash in the immediate neighborhood is imminent.

The first-degree alarm is effected by the electrostatic field between cloud and grounded objects, whereas the second is caused by the flow of corona current from antenna to the cloud overhead. In either case, the alarm serves its purpose to protect personnel involved in manufacture, storage, and use of explosives.—Electronics, May, 158

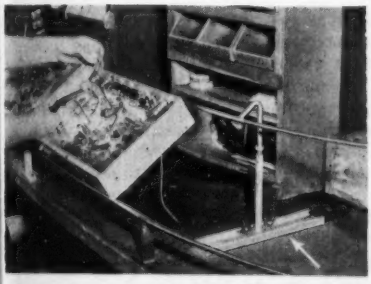
WORK STATIONS on wire-tinning line are served by a common duct for fume exhaust. Formerly in the final assembly line, operation is now on "pre-preparation" line. Component parts quality has been improved; overall output is up.



SOLDERING IRONS are now positioned in a holder within easy reach. Solder is on reel above work-place. Exhaust carries off smoke and fumes. Work is easier and more pleasant; housekeeping is improved; operational time is reduced.

Easier Work

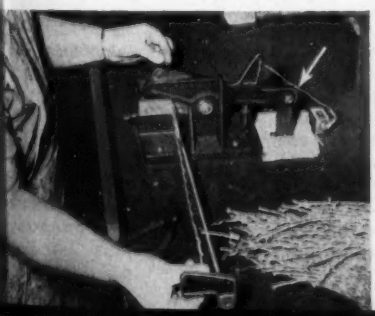
Five work simplification developments of Hallicrafters Company are shown. Costs have dropped, quality is up, work is easier.—Factory, May, 112

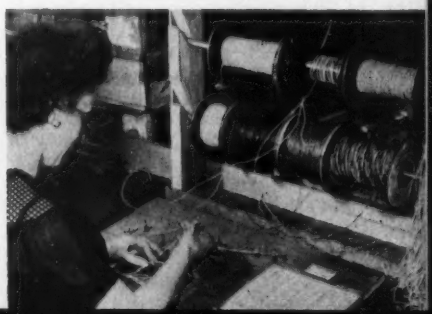


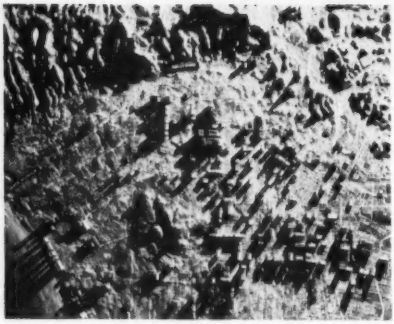
WIRE CUTTING and piece counting once took three manual operations. Now, automatic puller feeds wire from coil to cutting bench. Here, wire is pulled through foot-actuated cutter to preset bench mark.

REAR ASSEMBLY rack is adjustable, wing nuts permitting rack-foot to slide on table top. With this fixture all models can be handled on one line. Layoffs during change-over are eliminated.

INTERCHANGEABLE spindles mounted in a bracket are used now to form wiring harnesses. Wire is threaded through loop in cotter pin and pulled down between legs. Job description chart is at right.







TELEVISION COVERAGE

A relief map of Los Angeles area with an automobile headlight bulb placed on the map at site of television transmitter reveals coverage in planning antenna sites. Shadows cast by intervening hills and buildings outline non-coverage areas of the high-frequency waves. A quick check can thus be made to show areas covered by line-of-sight signals.—Elec World, May 8, 86

Wire Connections Need More Attention

Investigation, sponsored by Copper Wire Engineering Association and conducted by Armour Research Foundation, revealed that mechanical connectors for application on copper conductors of overhead lines should develop contacts such that resistance through a section does not exceed that of an equivalent length of conductor.

Principal source of trouble was found to be high resistance between individual strands and layers of strands in one conductor, not high joint resistance between conductors. A positive-pressure, low-resistance contact must be established to withstand fault current conditions.

Tarnish films do not interfere with good connections at time of installation, but surface dirt should be removed. Also, there is need for development of a chemical cleaning grease or paste for practical overhead line use.—Elec World, May 8, 79

Tensionless Processing

Continuous processing of prints, acetate spun and filament fabrics, sheers, and crepes on open-width washers without tension is possible with Rodney Hunt Machine Co.'s Tensitrol. Processing is possible regardless of shrinkage or stretch without changes in speed of various parts of the unit. Only bottom rolls are driven, their surface speed exceeding nipper roll speed by a percentage greater than the cloth shrinkage.

The bottom rolls slip continuously on the fabric, which remains relaxed in all sections of the unit. The unit is being tested in continuous dyeing of wool fabrics.—Textile World, May, 145

Underwater Welding

Extensive underwater construction in Russia will, it is claimed, make use of new techniques of underwater welding and cutting. Among them are a method of combined arc and oxygen operation and also a semi-automatic welding method.

As oxygen tanks are hard to supply underwater, a benzo-cutter has been found reliable. New carbon electrodes have been developed to replace tubular steel electrodes formerly used. Soviet engineers say that the latter burn out too quickly underwater.—Weld Eng, May, 84

New Shot-hole Casing

Jones & Laughlin Steel Corp. has developed a new casing for shot holes, for use in oil prospecting. Dynamite charges which determine underground formations, previously damaged the lower end of the casing and casing had to be discarded. J & L casings are made in sections and can be fitted end-to-end by built-in threads. When lower section is damaged, another piece can be fitted onto remaining lengths.—Business Wk, May 15, 91

Coaxial Helicopter Design Gives Low Vibration Level

Low vibration level, greater useful load, and improved stability are incorporated in Bendix Helicopter Co.'s two coaxial contra-rotating helicopters—a single-seater and a 5-place craft. The single-seater has a 25-ft. rotor dia. and is powered by a 92-hp. engine. Vertical rotor displacement is 2⅛ ft. The 5-place ship has a 48-ft. rotor dia.; rotor displacement is 4½ ft. Pratt & Whitney 450-hp. engine is displaced 14° from vertical axis.

Coaxial contra-rotating rotors result in increased lift. Flight tests also show a gain in thrust over a single rotor averaging 6% from aerodynamic advantages alone. Absence of tail rotor saves about 8% in power available for lift. The company estimates that for each percent gained in lift, a gain of 3-5% in useful load is realized.

Upper and lower rotor parts are 90% interchangeable. Blades are laminated birch spar to about 30% chord and a plywood covering. Leading edge is bonded stainless steel.—Aviation Wk, May 17, 21

Merchant-Marine Radio

The past decade has seen many advances in ship communications for message handling and safety at sea. To provide a forecast of future equipment needs, certain trends are evident:

1. Universal adoption of crystal control on all working frequencies of high- and medium-frequency equipment.

2. Greater use of packaged, one-unit installations.

3. Widespread use of call-signal and SOS-responder device for supplementary watch-standing.

4. Greater application of marine radiotelephone, particularly the vhf. f-m. type.

5. Installation of radio facsimile on many passenger vessels.

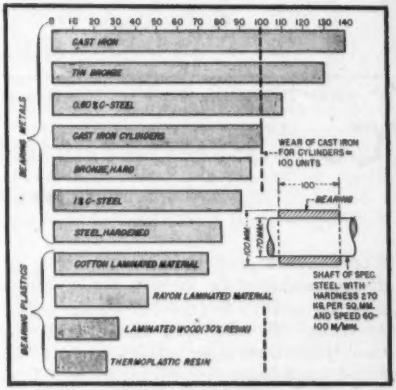
6. Limited use of television for public entertainment on the larger passenger ships.

7. Increased popularity of high-frequency bands for normal ship-radio traffic.—Electronics, Jn, 84

Steel Forms Speed Building

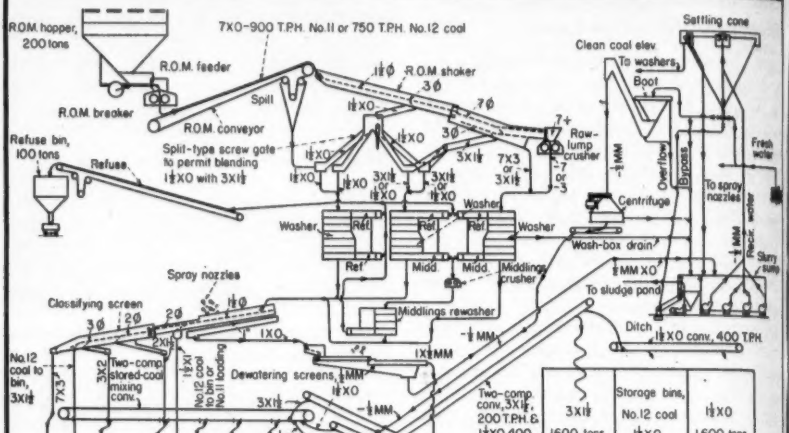
Residential building in Houston, Tex., has been speeded by use of steel forms for pouring hollow concrete walls. Forms are two 9-in. exterior channels connected at top and across ends by adjustable bars. Crank tightens bars. Walls are 4-in. thick with a 2½-in. hollow space between.

Outside forms can be used to pour solid walls. Extra-dry concrete is used. A lower band poured in the morning will support another layer that afternoon.—Eng News-Rec, May 13, 94



RELATIVE WEAR VALUES

Wear-resistance tests, conducted by Dr. N. N. Sawin, Austria, showed superiority in wear of synthetic materials over bronze, cast iron, and steel. This should be considered in design and material specification. The thermoplastic resin gained best wear resistance after 24-hr. tempering at 100° C. Rayon and cotton laminated materials showed better wear resistance on side surfaces than on top, whereas the top surface of plywood was superior.—Am Mach, May 20, 98



FLOWSHEET shows setup for Homestead Coal Co.'s strip mine . . .

Coal Preparation and Storage

Two-seam stripping operation plant is centrally located to equalize haulage distances. Plant works one section of mine at a time

PREPARATION AND STORAGE facilities at Homestead Coal Co. serve a 2-seam stripping operation. Seams are separated by 18 in. of fire clay and about 3½ ft. of limestone. Operating on 7x0-in. coal, the 5-cell wash-boxes handle 1,000 tph.; 3x0-in. coal is worked at 750 tph.

Plant is centrally located to equalize truck hauls. Belt conveyors, 700 ft. long, extend out from tipple. They eliminate congestion around plant, shorten hauls, and reduce truck maintenance by cutting out braking of loaded trucks on downgrades.

Plant will process coal from one side of the property, then a shift of coal and refuse conveyors will permit working on the other half of the property.

Run of mine coal is dumped into a 3-lane truck-hopper and fed to a crusher which reduces it to minus 7 in. It then is moved to the 6-track preparation plant by a 609-ft. long, 48-in., 6-ply belt conveyor. In the plant, coal is separated into plus 7-, 7x3-, 3x1½-, and 1½x0-size and then washed in four washers. Refuse is carried to a 100-ton refuse bin.

Washed coal is sluiced to a 765-tph. shaker classifying screen and separated. The 1,600-ton storage-bin bottoms are lined with fireclay to reduce abrasion.

Reciprocating feeders, 48 in. wide and

8 ft. long, control movement of coal from storage bins to conveyors. The 3x1½ is withdrawn from bins at 200 tph., 1½x0 at 400 tph.

Quality of preparation is not affected by starting and stopping of the line, because cone design provides extra water to wash boxes by gravity for immediate starting. An 8-in. sludge line removes sludge from plant and it flows, by gravity, to an abandoned pit.

Final loading of coal involves four unusual mechanical features:

(1) The 42-in. boom belt for 7x3-in. coal can be operated at two speeds, motor having both a 5- and 10-hp. rating.

(2) Back-loading chute facilitates car changing on tracks equipped with loading boom. Each chute is counterweighted. As operator raises loading boom, chute pivots, causing coal to fall into the empty car.

(3) The three shuttle-type car-changing conveyors are mechanized instead of hand loaded.

(4) Car retarders are air-operated by one man, air at 120 lb.—Coal Age, May, 114

Artificial Hands Improved

A molded vinyl plastic glove, developed by the U. S. Army Prosthetic Research Lab, slips over a mechanical, artificial hand. From a few feet it can not be distinguished from real flesh. Gloves are mass-produced in numerous styles, five colors, five sizes, and two degrees of vein prominence. Hairs can be inserted to simulate the hair pattern of the other hand. Hand is operated by a shoulder harness.

A second test in artificial hands, conducted by the Army, is a bicep-piercing operation called ciniplasty. A permanent channel is formed through the muscle and a metal rod passed through the muscle. A cable runs from the rod to hand. Flexing the bicep of the handless arm operates the hand.—Science Ill, Jn, 40

Single-test Unit Checks Gas Turbines

Northrop-Hendy Co.'s single-test gas-turbine engine (Turbodyne) tester saves many hours of test time by making 500 simultaneous visual and recorded temperature and pressure readings. In 10 min. vibration data can be had that would take two engineers 1 wk. to gather by standard methods.

Ten men operate the Turbodyne, mounted in a 15-ft. concrete-walled room. Headsets and throat microphones enable testers to communicate over engine blast. Results from tests are extraordinarily accurate. Additional advantage of integrated instrumentation is that it provides a constant damage survey of the engine. Repair of damage is shorter through elimination of complete engine teardown.—Aviation Wk, May 10, 27

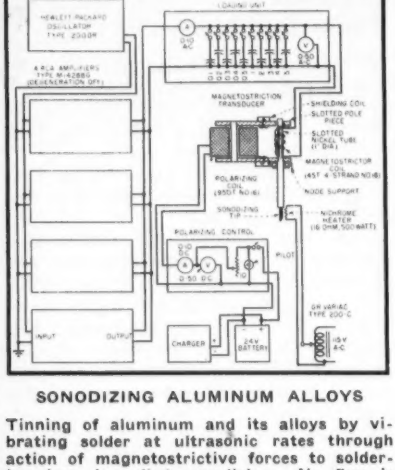
Sealed-off Workings Serve as Air Receiver

Homestake Mining Co., Ltd., Southern Rhodesia, sealed off mine workings to form a large-capacity underground air receiver when air compressor capacity proved too little for expanding operations. Stout concrete dam sealed off a drift and crosscuts to form a 46,000-cu. ft. area.

After receiver was formed, a 229-cu. ft. compressor, one of three previously in use, was abandoned, resulting in great saving of power. Three or four machines now can be added underground without overloading power system.—Eng & Min J, May, 94

Use Two Ends for Nylon Seams

Defective 10- and 15-den. nylon stockings can be reduced by using two ends for seaming instead of the standard three ends. With proper machine adjustment, thread will prevent fabric from throwing out along seam as easily as in three-end seaming.—Textile World, May, 133



SONODIZING ALUMINUM ALLOYS

Tinning of aluminum and its alloys by vibrating solder at ultrasonic rates through action of magnetostrictive forces to soldering iron is called sonodizing. No flux is needed. Experimental setup at Lockheed Aircraft Corp. consisted of four amplifiers, oscillator, loading capacitors, controls, and transducer. The nickel tube is activated, from the oscillator tuned to give maximum vibrational intensity, at resonance, thus providing ultrasonic vibration to the stainless-steel sonodizing tip soldered to the tube. Good results were also obtained on stainless steel and chromium-plated surfaces.—Electronics, Jn, 90

Margarine Storage

Studies just completed by Armour and Co. show margarines containing animal fats or soya oil can be stored at 5° and −10° F. for 1½ yr. without change in color, texture, and flavor.

Two other temperatures used in the test, 28° and 45°, resulted in considerable deterioration of the product. This occurred in only 34 days at the higher temperature.

After extended storage at the low temperatures, no tallowy flavor or greenish color appeared, nor was there any apparent salting out in any of the samples. All samples were readily workable.—Food Ind, May, 110

Straight-Line Production for Accounting Machines

Handling costs are down 75%, efficiency up 35%, and production up 35% since production at Burroughs Adding Machine Co.'s Detroit plant was put on progressive flow, straight-line principle. Previously, the complete typewriter-accounting machine was built by one highly skilled worker. It took 2-3 yr. to train a worker to assemble these highly complex machines.

By subdividing the work, a skilled worker is developed in 2 wk. Machines are fed directly to benches eliminating lifting of 1,000-lb. machine on average of four times. Number of workers has been reduced. Standardization has reduced the number of models from 5,000 to under 100, yet these few models will do virtually all the calculations previously done by 5,000 models.—Factory, May, 82

Is Vertical Fin Necessary?

National Advisory Committee for Aviation engineers believe that elimination of the vertical fin is possible; tests are being conducted toward that end. Elimination would reduce plane drag, reduce problem of control-surface balancing and stick force, and eliminate undesirable force variation with surface direction. It may also answer the question of control problems at supersonic speeds.—Aviation Wk, May 24, 23

Speeds Shaft Lining

Pouring concrete linings rapidly behind shuttering at the Van Dyke Consolidated Mines, South Africa, was speeded through use of an "octopus". It is a 2½-cu. yd. steel bucket with ten hoses around its periphery to deliver concrete. With the device, 2½ cu. yd. can be placed in 15-20 sec. Shaft sinking progresses at the rate of 300 ft. per month.—Eng & Min J, May, 82

Ceramic Pots Reduce Hazards in Steel Hardening

An outstanding development in furnace equipment for salt-bath hardening of high-speed steel, high-temperature ceramic pots have long life and do not contaminate the bath. Pitting and decarburizing hazards are reduced.

A ceramic, for satisfactory service, must be neutral to the bath and neither spall nor disintegrate at 2300° F. It must have a low coefficient of expansion, less than 10% porosity, and be prefired above 3000° F. A ceramic pot, with proper preheating and care, should last a year.—Am Mach, M 6, 118

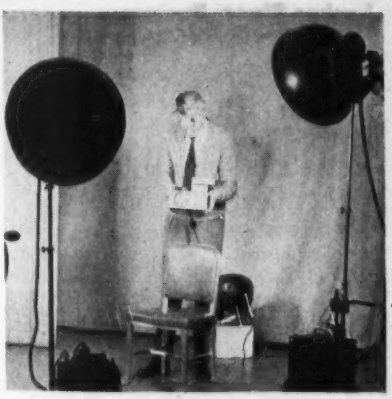
Water-Repellent Silicone

DC-1107, a Dow Corning silicone, has successfully made organic fibers water repellent. The new silicone differs from other silicones since in heating at relatively low temperatures it develops its hydrophobic properties. It is a straw-colored silicone, having low viscosity, only slight volatility, no acidity or alkalinity. It polymerizes in and on fibers at 300° F.

It is resistant to dry-cleaning solvents, water, and detergents. Most of the application is done with an oil-in-water immersion. It can be padded onto textiles and hydrophobing develops with conventional equipment.—Textile World, May, 124

Simply Adjusted Brake

Double-end wheel cylinders at both ends of the brake shoe gives positive actuation in the new Wagner Electric Corp. self-centering brake for heavy-duty vehicles. Adjustment is simple, using an Allen wrench. Shoe centralizing adjustment is not necessary, as shoes are centered automatically by moving radially along the sides of anchor blocks. Brake shoe anchor points are closer to axis than in conventional brakes.—Am Auto, May, 54



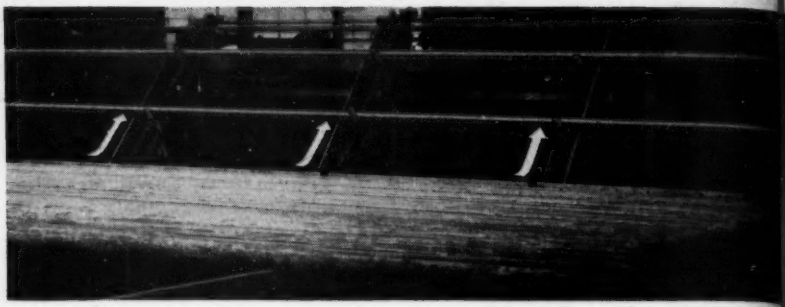
LIGHT METER

Photoelectric light-integrating meter, made by General Radio Co., measures incident light from capacitor-energized electric flash lamps. Object is to determine proper camera aperture, which can be read directly on the meter, so as to obtain properly-exposed photographs for both color and black-and-white film. Output of flash equipment can also be obtained by comparison with standard units. To operate, meter is held in subject position and aimed at flash lamp which is tripped remotely by pushbutton on end of a cord.—Electronics, Jn, 78

Low-Voltage House Wiring

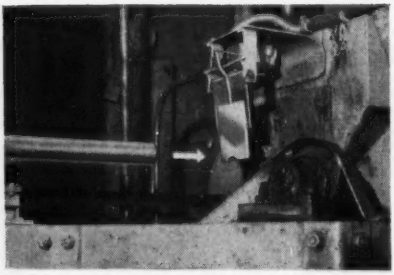
Remote-control electrical wiring system using low-voltage (25 v.) current through 22-gage wire for homes, factories, and offices has been developed by General Electric Co. Switches are connected through relays to outlets by the lightweight, insulated wire. One transformer supplies the low voltage current for an average house.

Midget 25 v. relay is mounted at each outlet or light. Relay opens and closes the 115 v. circuit when switch is pushed. There is no danger of shock at switch. No more than three outlets should be wired to a single switch unless a larger transformer is used.—Business Wk, May 22, 65

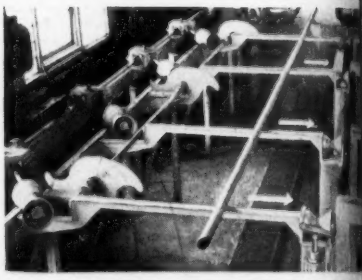


1 CHAIN CONVEYOR picks up tubes from incoming conveyor, delivers to rolls that carry them to cleaner. A trip switch stops conveyor to prevent feeding more than one tube

Locomotive Flues Cleaned Auto

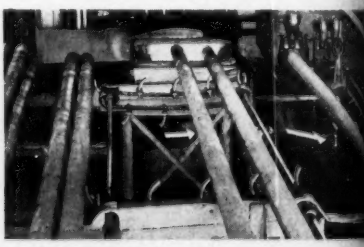


2 FLUE TUBE, as it enters Roto-Blast, raises flap and operates switch to start flow of shot to centrifugal wheel.

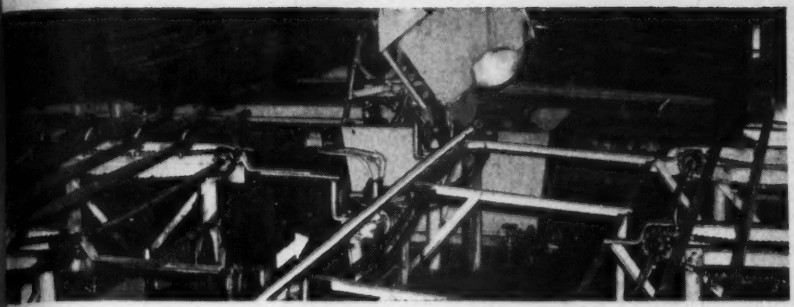


3 CLEANED FLUE continues along rolls to end stop when cam-shaped arms lift it to gravity conveyor leading to rolls.

4 FRICTION SAW cuts off 3 in. Rolls reverse to back-off tube, then lifted to conveyor and flash-welded with a safe end.



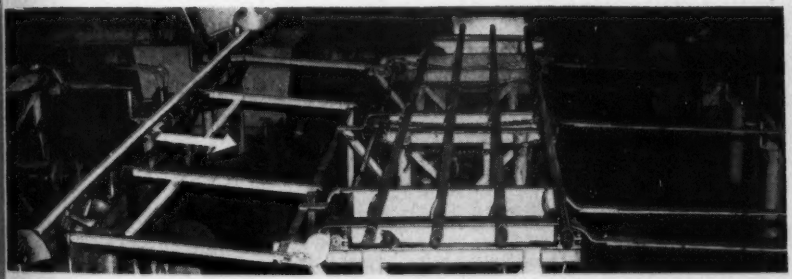
5 OPEN-SIDE FURNACE heats flue end for swaging. Tubes then roll down conveyor to swaging machine.



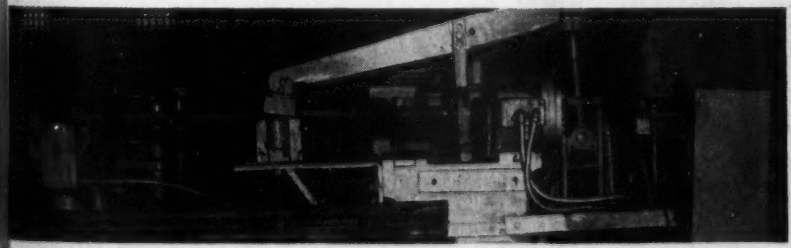
6 SWAGED TUBE feeds toward cutoff saw until it passes a target switch. Rolls reverse to feed tube against target switch, thus gaging overall tube length.

...atically

New B & O RR. shop replaces tumbling by shot blasting, hot saw by friction cutoff. —Am Mach, May 20, 102



7 CUTOFF SAW trips a switch when it reaches end of stroke. This stops saw motor and returns blade. At same time, pneumatic jacks are energized to deliver flue tube to next gravity conveyor. This delivers flue to next furnace chain conveyor.



8 HEATED TUBE, leaving furnace, rolls to an expander. As it hits the rolls, it trips switch controlling four cams. First stops feed motor, second operates clamp, third the expander, and fourth the pneumatic lift to raise tube to collecting cradle.

TECHNICAL SHORTS

Power Plant Burns Lignite—Granby Consolidated Mining, Smelting & Power Co. has had 10 yr. successful experience in burning lignite and sub-bituminous of high ash and moisture content. Success secret is ample pulverizing-mill capacity plus a primary heater to supply 600° F. air to mill inlets. Heater is a tubular type in the first pass of the boiler.—Power, May, 76

Sweating Tips—Sweating auto-radiators to tube ends has been wasteful because of hand-dipping of ends into molten solder. One maker now punches a solder strip so it slips over tubes before header plate is pressed on; end is heated and excess solder runs off, is reclaimed. Latest trick is to coat header stock with solder as it comes from roll. Header is formed afterward.—Am Mach, May 20, 105

Fast Pipe Laying—Over 75 miles of 48-, 36-, and 24-in. prestressed concrete water pipe was laid in record time in Saginaw-Midland, Mich. One crew placed 61 lengths of 36-in. pipe in a 9-hr. shift by using a back hoe for trenching and a crane to place pipe. Other crews laid pipe with hoe. All crews used bulldozers for back filling.—Cons Meth, Ap, 104

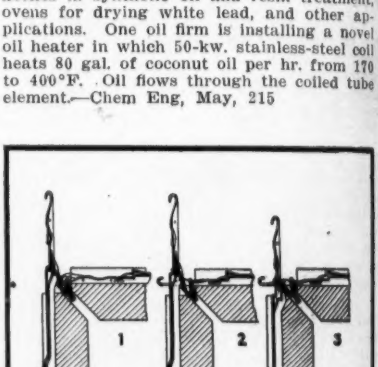
Better Meals Aloft—Designed by United Air Lines, a new service cart to keep hot meals hot can be hooked to portable ramp generators. Of steel frame and aluminum skin, cart is 36x96x60 in. Hot food and liquid containers have electric heating elements. Cart is lifted by fork-lift truck to plane door. —Aviation Wk, Ap 26, 45

Changes Egg Protein—U. S. Dept. of Agriculture has discovered how to modify the protein within an egg white. Varying the protein in feed between casein and soybean meal determines egg composition and prospective characteristics of the chick when hatched. Probable reason is the amino acids from the two feed sources.—Food Ind, May, 156

Seaweed Makes Cloth—Scottish Seaweed Research Assn. recently displayed a greenish fabric made from seaweed. The association believes this unexploited raw material can be processed into plastics, transparent paper, cosmetics, films, ice cream, a sugar substitute, baby food, human and animal foods, inks, and fertilizer.—Business Wk, Ap 24, 131

Bearing Plates Hold Poles—Central Illinois Public Service Co. now uses bearing plates attached to pole bases to restrict vertical movements and prevent overturning. Plates also are connected to ground wires, thereby reducing ground resistance and improving lightning protection.—Elec World, May 8, 92

Electric Heating—Chemical-plant trend in Sydney, Australia, is electric heating—for kettles in synthetic oil and resin treatment, ovens for drying white lead, and other applications. One oil firm is installing a novel oil heater in which 50-kw. stainless-steel coil heats 80 gal. of coconut oil per hr. from 170 to 400°F. Oil flows through the coiled tube element.—Chem Eng, May, 215



LOOP TRANSFER METHOD

R. L. G. T. (Mellor Bromley) system of transferring loops from one needle to another mechanically is shown. System makes use of an expander instrument in addition to needles. Expander and needle are in the same trick together and are actuated together, butts being at the same position. Upward-movement of transferring needle extends and expands loop sideways and dial needle enters through gap. Point of expander rests in an eye and downward movement of transferring needle and expander causes this point to pass over receiving needle and then back into eye. Transfer is completed as the downward movement presses off the loop. Three positions show dial-to-cylinder and cylinder-to-dial transfer.—Textile World, May, 120

Oven Boosts Quantity—One manufacturer of small motors has speeded operations and reduced labor cost by installing new type bake oven. Special shelfhook hangers accommodate a gross of small fractional-horsepower armatures. Racks are removed when larger units are baked. Temperature is held at 500° F. with three air changes per min.—Elec C&M, May, 95

Sprayed Wiring Tests—Research by Minneapolis-Honeywell Regulator Co. on sprayed wiring for control amplifiers showed that groove widths of 1/16 in. are satisfactory. Groove depth for best adhesion of copper to plastic base was critical and should be held at 0.040±0.005 in.—Electronics, May, 128

Luxury Buffet Bus—American Buslines, Inc., has super-luxury ACF-Brill buses operating express between New York-Chicago-St. Louis. Each bus is equipped with an airline-type restroom and a buffet, and is served by a steward.—Bus Trans, May, 90

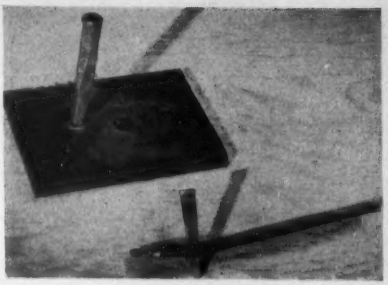
Instant Dental X-ray—A New York dentist covered a small metal disc with a barium compound and mounted it on a dental instrument handle to make a mouth fluoroscope. When X-ray beams are passed through the patient's jaw, dentist gets an instant picture of patient's teeth. X-ray film development time is bypassed.—Science Il, May, 41

Seal-beam Lights on Locomotives — New York Central R. R. locomotives will be fitted with seal-beam headlights. Light beam is focused from a small reflector area, two lights in place of one. The two bulbs cost the same as one.—Business Wk, May 22, 39

Prevents Car Damage—Felt pads, shaped to the contour of a car body, line walls through which car bodies are carried by conveyor at Packard Motor Car Co. Slight sway formerly scratched and bumped bodies. Now felt pads prevent scratching.—Factory, May, 136

Preheating Helps Weld Turbo—A fractured shaft of a 25,000-kw. turbo-alternator at Bunnerong, Australia, was preheated to 500°F. by induction coils wound about 6 in. from both sides of fracture. Normalizing followed welding. Several days were saved by using induction heat.—Weld Eng, May, 66

Indium Ups Engine Life—Secret of Pratt & Whitney long engine bearing life is indium, now made commercially as an alloy. Element is alloyed with lead, silver, and copper layers topped with indium to prevent removal of lead by corrosive acids.—Aviation Wk, Ap 5, 16



POWDER HARDENS STEEL

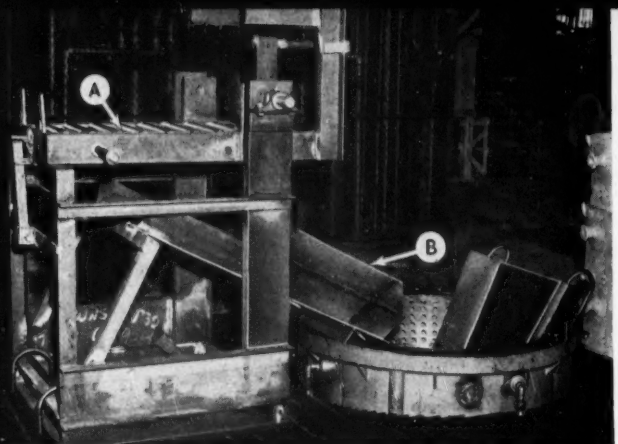
Deep-penetration hardening of tools and even low-carbon steel is possible with Hi-Speed-It, a powder produced by Necamp Metallurgical Laboratories. At 1400-1700° F., it alloys with, and fuses to, the piece being hardened and quenches with no scale. It contains no cyanide; no special equipment is needed. The parts shown, a nail driven through ⅛-in. steel plate and a piece of concrete-reinforcing rod through ¼-in. plate, were hardened with the compound.—Am Mach, May 20, 134

Making Rain for Money—Weath-Air Inc. makes rain-making a business in the drought-stricken farm area near Phoenix, Ariz. Clouds are seeded with dry-ice pellets. Charges are a flat fee for each flying hour guaranteed plus an additional sum per acre-foot of new water added to supply.—Eng News-Rec, Ap 15, 64

Boots Protect Piles—Wrought-iron boots, filled with concrete, protect precast concrete piles of the Yarmouth, Mass. bridge. Boots are 6 ft. long, made of ¼-in. corrosion resistant plate in two channels. Sections are bolted together, then filled.—Cons Meth, May, 107

Parasite Fighter Ready—The McDonnell XF-85, parasite fighter (See McG-H Digest, Feb. p. 17), designed to be carried in the fuselage of the B-36, is ready for drop tests. A B-29 will serve as the mother ship.—Aviation Wk, May 17, 10

Cleans Mine Trackage — Mechanical track cleaner, built in the shops of Pittsburgh Coal Co. of spare parts, can load a 3-ton car in 4 min. Front end of a pit-car loader was cut down and a flared plate welded on so as to rest close to the top of the ties and span inside of truck. Two curved plates gather coal outside the track. Two men operate the unit.—Coal Age, May, 170



DUMPING RACK

This heat-treat dumping rack at Borg-Warner Corp. is safer for workers, easier to operate than hoist-and-hand-tip units, and takes less time. Parts from hardening furnace are placed on roller conveyor section A. Angle iron section above holds container while parts are dumped. Operator trips fixture through 180° and parts fall onto chute B. From chute, parts fall into oil quench bath. — Factory, May, 134

Lashes Aerial Cable

To reduce installation costs of aerial cable, Florida Power & Light Co. developed a method of lashing cable in the field. Borrowing an idea from telephone company scheme of lashing communication cable, the power concern uses a traveling spinner.

This spinner rides along the supporting messenger on two small, grooved wheels and lashes one, two, or three single-conductor cables to it. Cables are carried through the machine on pulleys at front and rear. As machine moves, the lashing-wire drum rotates around the whole assembly, binding the cables tightly to the messenger.—Elec World, Ap 24, 69

Quonsets as Mine Portals

Consolidated Coal Co. used multiple-arch quonset huts as portal building. Underground travel was reduced 5 mi.; the building will return initial cost in a year. Mine office, bathhouse, lamp room, supply house, shop, sub-station, powerhouse, and restaurant are all quonsets, and management will use huts for all future construction.

Hut life is said to be 10 yr., with salvage value expected to be high. Cost per sq. ft. was $2.47 compared to $3.10 for cinder-block walled construction.—Coal Age, May, 96

Continuous Fly Control

An electric vaporizer, called Aerovap and developed in England, uses pure DDT to give continuous control of the common housefly. The DDT is not dissolved in oil or made into a watery emulsion.

The device consists essentially of a cup resting on a heating unit. DDT crystals in the cup are melted and vaporized, about 1 gram in 24 hr.

First use in England was to vaporize germicidal agents, later to purify air in bomb sheters.—Food Ind, May, 116

New Cold-Rolling Mill

Cold-rolled steel strip output will be raised 3-10% and cost cut by a new cold-rolling mill developed by Cold Metal Products Co. Less breaking of strip will result. Mill employs four rolls to move steel—two small rolls that roll the steel and two larger backing rolls. Driving power is applied to backing rolls.—Business Wk, May 22, 32

Gas Packaging Retains High Quality of Foods

Gas-packaging method, valuable for several kinds of food packed in flexible bags, promises to maintain peanut freshness from plant to consumer. The package, called Flex-Vac, is made of thin-gage aluminum foil laminated to cellophane and bleached kraft paper.

After peanuts are roasted, blanched, cooked, evacuated, and salted, they are bagged. Bags are prepared for heat sealing and put in a vacuum chamber which is drawn to about 28½ in. of vacuum. Nitrogen under pressure is entered into the chamber, and bags are then heat sealed.

The new package offers physical protection, as it is moisture, grease, insect and dust proof. It also protects against chemical change or deterioration. Other development work underway with gas packaging includes bacon, frankfurters, cheese, coffee, and frozen fish.—Food Ind, May, 71

Oscilloscope Camera

By a new camera designed for both still and continuously moving film photography, continuous recordings of oscilloscope patterns are made on film or paper at speeds from 1 imp. to 5 fps. This speed range of 3,600 to 1 is provided by an electronic motor control and a two-speed clutch.

Many uses are indicated. One is to study the effects of a heavy load on the performance of a synchronous motor. Another is to show the starting voltage and current characteristics of fluorescent lamp fixtures.

Other electrical uses include recording of oscillator drift and obtaining of voltage time curves of power lines, power supplies, voltage stabilizers, and regulators.

In nuclear physics, it can record the output of a particle counter tube; in biology, show potential of a frog's sciatic nerve; and in acoustics, measure duration of sound reflections from walls.—Electronics, Jn, 102

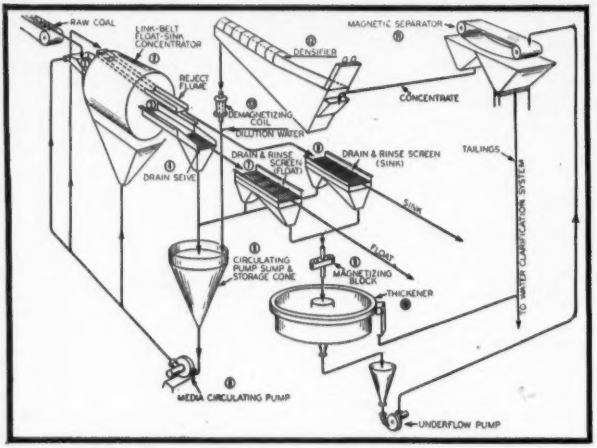
Printing Embossed Surfaces

Printing can replace wasteful hand filling of embossed surfaces by use of a new machine called the Acro-Printer. This machine carries a perfectly molded synthetic rubber die of sharp and well defined detail with a slightly smaller face than the required design to allow for bleed of enamel.

Enamel is applied to the die by an inking platen, of the same contour as the part to be filled, that has been coated with enamel by a synthetic rubber roller. Operation is simple and quick. A backward movement of the operating handle places fresh enamel on the die. A forward movement impresses the die squarely on the work surface, thereby filling it.—Am Mach, May 20, 109

PLASTIC TILE LOCKS IN PLACE

Bathroom or kitchen walls can be tiled in one day with these self-locking polystyrene plastic tile developed by Pittsburgh Tile Co. The interlocking grip makes the tiles self-aligning and tile can be applied by unskilled labor. A mastic holds tile to wall. Mirror shows interlocking grip.—Science III, Jn, 76



FLOAT - SINK concentrator is shown. Plant can be started and stopped without loss of clean coal or operating efficiency.

Float-Sink Concentrator Works Coal Over 6 In.

Coal, ores, and other similar materials are cleaned in Link-Belt Co.'s new float-sink concentrator. In coal cleaning, separation medium is a mixture of water and finely-ground magnetite. Unit has high operating efficiency when a large percentage of the material is near the separation gravity.

It can handle coal over 6 in., thus reducing necessary hand picking. Specific gravity can be regulated easily.

Feed enters through flume (1) and is immersed in concentrator (2). Material rises and passes over discharge weir (3) and stationary seive (4) where medium is drained off. Rotary wheel raises sink material to flume where it passes to screen (8). It then passes under sprays and over drain and vibrating rinse and dewatering screens.—Coal Age, May, 192

Wycillin—New Penicillin

Wycillin, a new injectable penicillin for combatting pneumonia, venereal diseases, and other bacterial diseases, has been discovered by Wyeth, Inc. A water solution is claimed to retain its potency for seven days without refrigeration. Injections cause no pain; it is non-toxic; affected organism won't build up a resistance to it.

Cost is about the same as ordinary penicillin.—Business Wk, May 22, 51

Spot Welds Crack-Free

Tests conducted by General Electric Co. indicate that the only way to attain spot welds free from internal cracks in aluminum alloys is to increase electrode pressure.

In 24 ST, high-quality welds demand use of relatively heavy equipment. To produce crack-free welds in 0.064-in. 24 ST Alclad requires electrode pressure of about 2,000 lb. Lower pressures caused internal cracks, extent of which increased with decreased pressure.

Peel tests on 1,000- and 1,200-lb. welds showed cracks parallel to faying surfaces. On 1,500-lb. welds, peel tests were normal, but exographs still indicated a slight internal cracking. These defects could not be consistently demonstrated by tensile-shear tests.—Welding Eng, May, 42

France—Prosperity Coming?

Business men and politicians see prosperity coming. Production of coal is above prewar level and sets pace for other industries

FRENCH BUSINESS MEN and governmental leaders are beginning to see prosperity in 1948. At the first of the year the outlook was black, but recent turns on both the economic and political fronts have given vent to optomistic forecasts.

Some reasons for this new confidence are:

(1) Production during the winter jumped unexpectedly to 115% of 1938.

(2) Government offensive against inflation is getting results.

(3) National budget is in balance for the first time since the war; credit conditions are improving; investment capital is more available to private business.

(4) Exports rallied after the December franc devaluation.

(5) ERP assures coverage of the deficit in balance of payments for the year ahead.

(6) A good wheat harvest.

Production restrictions, resulting from the wide-spread December strikes, have been wiped out. Production breakdown shows coal 20% above prewar, electric-power output 57% above 1938, steel up 8%, cement up 10%, tires up 30%.

Coal has been the production bottleneck. But spring found output at a million tons a week. Imports from the U. S. are continuing, as are imports from Poland and Britain. French industry is getting more and more of the Ruhr's coal and coke output and an increasing amount of the Saar's output. It should get a total of 78,000,000 tons this year as against 64,000,000 last year.

New hydroelectric plants scheduled will bring output to 100,000,000-kwh. daily, compared to 57,000,000-kwh. in 1938. With the increased coal and coke, steel production will jump. Production in March totalled 620,000 tons. The Saar's capacity is reaching prewar status. Second-quarter steel allocations were hiked 30%.

The foreign-trade picture is not as good as the production picture. Franc devaluation hurt. Volume remains at approximately the pre-devaluation figure, but dollars received are much lower. Tourist dollars this summer will help.

Less food will be purchased abroad after this harvest is complete. The country hopes to be self sufficient in wheat. Bread rations should be increased.

The government's anti-inflation action and raised production have helped to beat inflation. Producers and unions were forced to take price cuts, the principle cuts being—coal, 17%; electricity, 7%; wool cloth, 10%; knitting yarn, 10%; wool garments, 6%; farm machinery, 5%; and chemicals from 5–10%.—Business Wk, May 1, 113

CAR TURBINE

English research on gas turbines to power automobiles, buses, and trucks got a boost forward with this 5-ft. long, 250-lb. turbine. It developes 160 bhp. and can be adapted to any fuel. Designers claim it eliminates many parts needed in conventional engines.—Business Wk, May 15, 126

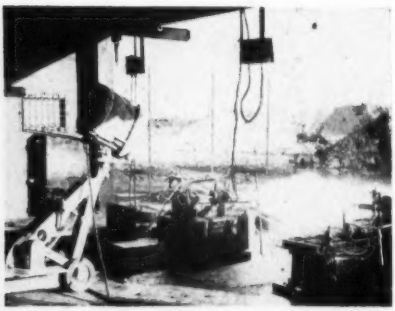
Progress in Fluorescents

Since the introduction of fluorescent lighting 10 years ago by General Electric Co., production, sales, and improvements have progressed rapidly. Sales in 1938 were 200,000 lamps. In 1947, 76,500,000 were sold. This year 100 million are expected to be produced by the industry in a wide range of shapes and wattage.

While fluorescent lamp production is about one-tenth of the country's unit volume in the general lighting field, it is nearly one-half the size of the filament lamp business in dollars.

The popularity of fluorescent light is based on the fact that it permits usage of higher levels of improved illumination —it gives twice the efficiency in the white lamp field and up to many times that of colored filament lamps. Unlike filament lamps which produce colors by subtraction (absorbtion of all rays except the desired ones), fluorescents transform ultraviolet energy directly into the particular colored light desired.

Popularity and improvements are expected to continue and possibilities are 70 lumens per watt instead of the present 50 to 60 for the 40 watt lamp. Foot candles of 150–200 are also expected to be as common as 50 footcandles today.—Elec Whols, Ap, 185



INDUSTRIAL TELEVISION

A Televising static firing of rocket motors at Aerojet Engineering Corp. permitted observation without danger to penrsonnel. Camera, mounted 2 ft. from test setup, was modified by wrapping unit in sponge rubber pads to reduce vibration. Coaxial cable led from camera to three 10-in. receivers in observation room 700 ft. away. Success indicates practical application of television for observation of similar hazardous industrial operations.—Elec West, Ap, 73

Will Make Own Oxygen

Ford Motor Co. is to construct four oxygen plants at River Rouge to supply 21 tons of oxygen per day, plus 75 tons of byproduct nitrogen. A 200-ton storage tank will be built to hold oxygen at 2,200-lb. pressure for use during peak-load periods. Oxygen will be used to scarf hot blooms, billets, and slabs but not for production of basic steel.

Nitrogen will be used for shrinking inserts, controlling atmospheres for heat-treating operations, spray painting, and blanketing of inflammable liquids.—Business Wk, May 22, 34

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Nylon Core in Worsted Yarn

England's worsted men are experimenting with two methods for increasing yarn strength in extremely fine goods: plying an end of nylon with an end of worsted, and spinning nylon as a core for worsted yarn. The latter looks most promising. Main disadvantage with the former is that the nylon shows. Using the core method, finer counts have been spun from a given top, counts as fine as 70x have been woven on automatic looms. —Textile World, May, 158

Chromated Proteins Save Metal

Chromated-protein coats protect metals —including zinc, brass, and aluminum— stored outdoors in mildly corrosive atmospheres according to the U. S. Bureau of Standards. Metal is first dipped in casein, albumen, or gelatin, this film later being impregnated with chromate. —Eng News-Rec, Ap 29, 115

BURIES COAXIAL CABLE

Laying multiple-circuit, coaxial cable through a deep ravine, two Caterpillar D8's pull the cable-burying plow. Previously, a tractor-drawn ripper has cleared underground right-of-way. Following plow is a 2-reel cable carriage. Last unit is snubbing train down the grade. Cable is laid up to 6 ft. deep.—Cons Meth, May, 90

Semi-Outdoor Power Plant

New 60,000-kw. power generating plant, planned by Jacksonville, Florida, will be half indoors, half outdoors. The turbine-generators will be under roof, as will the boiler firing aisle to the face of the boilers. The 850 psig., 900° F. boilers, however, and fans will be outdoors. Substructure will be a reinforced concrete mat extending under turbine room and boilers supported on concrete piling.—Power, May, 88

Load Research Methods

Purposes of load research are to establish bases for planning power-load building and to develop data for rate-structure analysis. To furnish the necessary knowledge, load research must extend to load origins.

Sampling is done in two ways: mass-average or selective. The latter method divides the whole into parts of like attributes and takes a sample from each part: that is, customers are divided into groups, each of which is composed of similar types of users. Data should be obtained from meters installed on customers' premises.

A load research period should cover a year, but periods of 2 wk. or a month, in the summer and winter, usually suffice. The data obtained indicate trends and characteristics of loads and how development of specific loads may be directed by sales effort for desired results. To check quantitative results of the test, data may be plotted into coincidence factor curves.—Elec World, May 22, 123

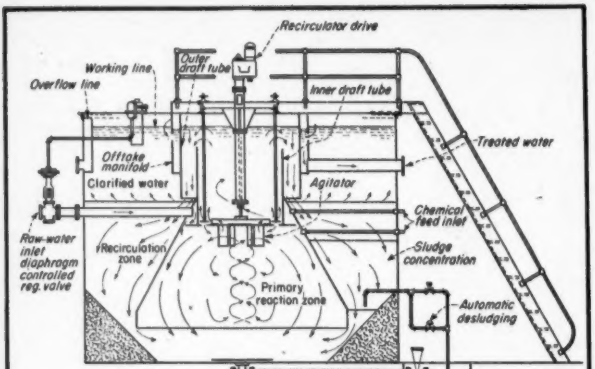
Transport Castering Gear

Crosswind landings with DC-3's are now possible with castering landing gears developed by Goodyear Aircraft Corp. and All-American Aviation Corp. The gear is similar to that used on personal planes.

Device is contained entirely within the standard air-oil shock strut. It uses a hydraulically-loaded cam, and a vane-type shimmey dampener, contained within and using strut as fluid and pressure source.

Wheels swing 30° to either side; 15° is considered sufficient. At the time of landing demonstration, wind was 20 mph. at 90° to runway.

With the castering mechanism, single-runway strips could be operated close to metropolitan areas.—Aviation Wk, Ap 26, 16



PURIFIES WATER

Rapid Reactor, developed by Cochrane Corp., combines basic elements for mixing, floc formation, settling, and thickening. Raw water and chemical reagents are introduced and agitated for coagulation of turbidity and partial or complete softening. It finally passes into integral settling and thickening reservoir from which it is collected for use. Retention time is usually 60-70 min. — Power, May, 118

Pumped Storage Hydro Costs Are Competitive

The pumped storage hydro-electric plant can compete cost-wise with steam and hydro plants. Well known in Europe, these plants are cheap to build and independent of rainfall as water is simply pumped to an upper basin and repiped through the machine for regenerative purposes.

Cost analyses show that pumped storage plants are a relatively inexpensive way to supply standby service. When interconnected with steam plants, economy of the latter is improved. At costs up to $255 per kw., they can compete with steam plants when pumping energy is supplied from off-peak steam.—Elec World, May 8, 83

Smallest Turbo-Jet

Boeing Aircraft Co. has made a 150-lb. thrust turbo-jet engine weighing only 85 lb. Single-stage, centrifugal-flow compressor has a two-piece aluminum casing integral with diffuser. A two-piece aluminum impeller is attached to front of main impeller and gives a compression ratio of 3:1.

Engine is 22 in. in dia. and only 29 in. long. Intended use is for missiles, glide bombs, small airplanes, and as starter engine for larger jet engines.—Prod Eng, May, 148

Good Storage Saves Ice

Artificial ice cannot be stored flat, layer upon layer, as can natural ice. Result would be freezing of blocks into a solid mass, as their surfaces are smooth and flat.

The modern storage method is to set the cakes on their narrow edge, large end to large end. As cakes are tapered so they can be more easily removed from freezing cans, this storage method leaves a small air space at the small ends for circulation.

Ice can be stored 70 ft. high by this method. But before permanent storaging, harvested ice should remain in dry storage at 26–28° F. for at least ½ hr. to remove all moisture and to prevent the blocks from freezing together.—Oper Eng, May, 44

New Material Developments

For the first time, extra-high-voltage cables are being sheathed in polyethylene instead of lead. This plastic will withstand 138,000 volts and is expected to last 40 yr. Polyethylene sheath is metal reinforced.

Cheap permanent magnets, produced from plastics and known as electrets, are now available. They serve satisfactorily up to 300° F. and have been applied successfully in the manufacture of microphones for home recorders.

Amalgamated-zinc and mercuric-oxide electrodes can replace zinc-carbon electrodes in dry cells. Result: half the weight but twice the cost.

Thinner aluminum sections for the same load will be possible by a reported method of increasing its modulus of elasticity—from 10,300,000 to 14,200,000 psi.—by addition of manganese.

Zirconium is a new competitor with stainless steel, tantalum, and stellite, particularly in turbine blades. It is three times heavier than aluminum.

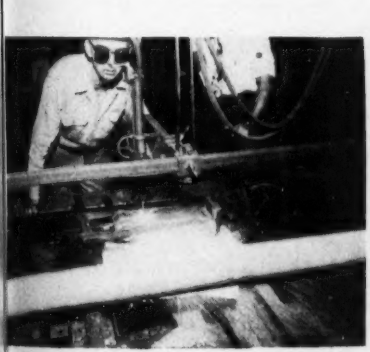
Under question now is whether superalloys for gas turbines will fail from fatigue or from distortion resulting from creep characteristics. Endurance limit is enough higher than creep strength to indicate failure will not be from fatigue. —Prod Eng, May, 106, 151

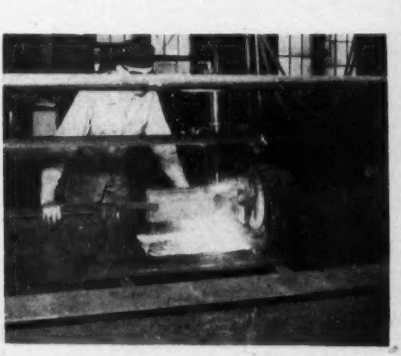
Produces Cholesterol

A new American Chemical Paint Co. plant is turning out cholesterol from wool grease. Cholesterol is the base for synthetic production of hormones, testosterone, and estradiol.

First water and dirt are removed from the grease, which is then saponified and soap removed. From the unsaponifiable matter, solvent extraction recovers the cholesterol. Inert gas around the cholesterol keeps it from decomposing while it is distilled, filtered, precipitated, selectively dissolved, and finally dried.

Up until successful operation of this plant, wool grease was considered too complex a material with which to work. —Chem Eng, May, 183





FLAME-CUTTING THREE-DIMENSIONAL SHAPES

Many intricate shapes at E. W. Bliss Co. are cut in one piece on a shape-cutting machine. Process consists of cutting the shape of one view out of a plate of sufficient thickness (left) to include other view in same dimension. The piece is rotated (right) on a predetermined axis usually through 90°, to proper position for cutting profile of second view. These "burnments" are replacing numerous items formerly forged or cast. They are especially useful for emergency replacements of single parts, as only extra tooling required is a paper templet for guiding of torch.—Weld Eng, May, 52

NEW PRODUCTS

Raw Wool Dyeing Unit—Felting, channeling, or disturbance of fibers is prevented in a new wool raw-stock dyeing machine. Dyes are mixed in a separate tank, then added to unit, assuring even dyeing. Circulating water packs raw stock. Entire batch is lifted out at once on a perforated plate. It is a Standard Fabricators, Inc., development.—Textile World, May, 148

Brazes Stainless Steel—Joining of precision, high-temperature stainless-steel parts is possible by sealing parts in box with copper next to joints. Box is filled with hydrogen, heated, cooled, and refilled with nitrogen. Process was developed by Industrial Heating Div., General Electric Co.—Am Mach, May 20, 136

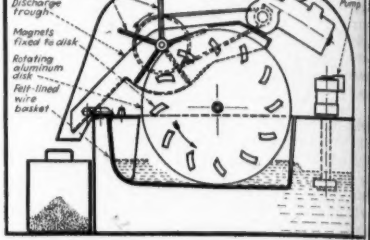
Cleans Concrete Pores—A product that removes grease and oil from concrete, no matter how deep it may be imbedded, has been introduced by Steelcote Mfg. Co. It also etches surface for painting. A companion product fills pores after cleaning, so concrete will not restain.—Food Ind, May, 166

Washer-type Precipitator — Raytheon Mfg. Co. has introduced an electrostatic precipitator which has a semi automatic washer for cleaning cells and ionizers, drying them, and applying precipitator ashesive. It requires 30 min. to wash, dry, and apply adhesive to a four-cell tier.—Chem Eng, May, 156

Measures Liquid Flow—The Stroboflow, built by K & K Engineering Co., consists essentially of a turbine rotating at flow speed. Rotor speed is determined from stroboscopic effect of light viewed through an aperture in the turbine disk.—Electronics, May, 138

Gun Painting — Micro-Spray air-operated paint gun gives fine atomization to produce a smooth, high-gloss finish. Developed by Kellogg Div., American Brake Shoe Co., it needs one fluid needle for all jobs.—Power, May, 166

Welding Positioner—Capable of handling work up to 30,000 lb., the positioner is portable and operates on powered chain tong principle. It can turn any nearly round object requiring not more than 400-lb. circumferential turning force at 3-26 ipm. It is a development of Kinmont Mfg. Co.—Weld Eng, May, 80



MAGNETIC FILTER UNIT

The Scrivener Clarifier, designed as an auxiliary coolant cleaning device for grinding and honing machines, is made by Philips Electrical Ltd. Coolant is fed past a revolving aluminum disk carrying permanent magnets. Revolving wiper arms sweep the swarf from the disk and deposit it in discharge trough. Circulating pump returns clean coolant to the machine. Capacity is 600 gph.—Prod Eng, May, 105

Spiral Saw Band—Designed to cut materia in any direction without rotating the work saw band has a cutting edge that spirals around the band. Made by DoAll Co., it als can be adapted to filing small radii and saw ing plastics. Sizes are 0.040- and 0.074-i dia. with 15-tooth pitch.—Am Mach, Ap 2 122

Measures to Billionth Amp.—Ultra-sensitiv electronic microammeter, developed by Radi Corp. of America, can measure dc. down t one-billionth amp. Current sensitivity ap proaches that of reflecting galvanometer.— Elec World, May 8, 136

Electronic Precision Drill—Electronic co trols replace operator skills in Telectronic Lab's new Microdrill. Thermal motor fee spindle into work, spindle being mounted a plunger against a compression spring. T Nichrome wires hold spring in check. Heat to a predetermined temperature, the wir elongate and release spring, the spring pus ing drill down to desired depth. Kn control rate of feed and depth of ho Standard 0.004 to 0.025-in. pivot drills a accommodated. Spindle speed is 50,000 r maximum.—Business Wk, May 8, 70

Universal Gear-shaver—The universal diagonal gear-shaving machine of National Broach & Machine Co. can shave by either diagonal or conventional methods. Gears with face widths to 2 in. can be shaved with diagonal table traverse. Machine capacities of two models are 1-8 in. and 1-12 in. on pitch diameters.—Am Mach, May 6, 148

Polystyrene Plastic Lens—Model PR-1 General Electric exposure meter has a polystyrene lens that increases photometric efficiency. The lens, in cylindrical form with only a slight curvature of the axis, improves distribution of light on surface of photoelectric cell.—Prod Eng, May, 98

Eliminates Lap-ups—Lap-ups are eliminated with use of new plastic cot for all types of drafting rolls. Cot is said to be six times as abrasive resistant as rubber. In an 18-month trial run on combers, no replacement or buffing of rolls was necessitated. They are developments of Hickory Specialty Co.—Textile World, May, 150

Horizontal Diesel—Designed for operation as cold-starting full diesel or for ready field conversion to gas, Lorain Type 0 engine is single cylinder, 2-cycle unit. Rated at 34.3 hp. at 450 rpm, it has condenser-type cooling system, eliminating need for water pump. It is offered by White-Roth Machine Corp.—Power, May, 118

Automatic Box Maker—A fully automatic apple- and pear-box maker, announced by Food Machinery Corp., enables two men to build 500 boxes per hr. The machine puts ends, sides, and bottom together.—Food Ind, May, 176

Compact Galvanometer—Leeds & Northrup Type E galvanometer has moving system, magnet, lamp, scale, and lamp transformer in single case. Instrument has both high and low sensitivity, with a second light spot moving only one-tenth as far as the main spot.—Elec World, May 1, 29

Protects Wet or Dry Surfaces—Sika-Seal, offered by Sika Chemical Corp., adheres to, and protects, wet or dry surfaces. A blend of asphalt, plasticizing and adhesive compounds, and solvent, it contains no tar. It is claimed to seal pores and hairline cracks.—Oper Eng, May, 74

R-F Generators—Three new 20-kw., 450-kc. radio-frequency generators consolidate generator, work table, and current transformers into one unit. Offered by Westinghouse Electric Corp., type A is for brazing and soldering, type B for hardening, and type C for all three operations.—Weld Eng, May, 76

High-energy Magnet—Permanent magnet, developed by Metallurgical Div., General Electric Co., has higher external energy than heretofore possible. Known as Alnico 5, it is expected to find extensive use in electronic, electrical, instrument, and novelty fields.—Chem Eng, May, 180

Glowing Ceilings—Ceilings are lighting units when Benjamin Electric Mfg. Co.'s fluorescent lighting system is used. Transparent plastic louvers reflect 18% of the light striking the surface and allows 71% transmission.—Eng News-Rec, Ap 15, 118

Flasher Penetrates Fog—Neon red-orange airport flasher light, developed by Dallons Laboratories, penetrates up to 3,000 yd. under zero fog conditions. Quartz lamp produces wave lengths approximating 5858 Angstrom units. It operates on 110-, 220-, or 440-volt current.—Aviation Wk, Ap 26, 31

SPEEDS PIPE-SCAFFOLD JOINTS

Joining T- and L-shaped crosses for pipe-scaffolding is speeded by an eccentric cross developed by P. R. Hallaender Mfg. Co. Pipes are fitted into cross without threading or special preparation and two hollow-head screws are tightened. Crosses are in aluminum or iron, sizes being 1¼x1 in. or 1¼x1¼ in.—Business Wk, May 1, 52

NEW PRODUCTS

Crossbelt Magnetic Separator — Ilmenite, monazite, chromite, garnet, epidate, wolframite, and pyrrhotite, many of which have never been separated magnetically, are done with a high degree of selectivity in a new magnetic separator. Machines are available with varying numbers of cross-belts—each belt producing a different product. It is a Dings Magnetic Separator Co. development.—Eng & Min J, May, 118

Cutting Wheel That Twists—Trimming of irregularly shaped aluminum, brass, and iron parts is simplified by Norton Co.'s new abrasive-fabric cutoff wheel. Built up of four layers of fabric with abrasive bonded in with resin, the new wheel lasts much longer than current wheels; it costs four times as much.—Business Wk, May 1, 48

Silences Exhaust Noise—Exhaust noises from trucks and buses are reduced by the insertion of an 8x30-in. expansion chamber in the exhaust pipe. Smoke and fumes are deflected up reducing ground odor. Expansion chamber is a development of Julius Ganssoin.—Bus Trans, May, 92

Unloads and Unscrambles—A case unloading machine, made by A-B-C Packaging Machine Corp., automatically unloads container-filled cases and places glass containers on the filling-machine conveyor in a single file. No operator is needed.—Food Ind, May, 167

Prevents Slippage on Belts—Sand, gravel, and wet mixed concrete will not slip back on steep inclines with Goodyear Tire & Rubber Co.'s ribbed-top conveyor belting. Chevron-shaped, ¼-in. ribs hold material. Belting is 30-48 in. wide.—Cons Meth, May 128

Provides Constant Batch Tension—Constant tension is maintained throughout building of the roll by Greystone Machine Co.'s batcher. Desired tension is set by a graduated knob, and differential drive and hydraulic gear pump maintain the set tension. Winding tensionless is possible. Mechanism is totally inclosed and is self-lubricating.—Textile World, May, 148

Speeds Wire Fastening—Tinnerman Products, Inc., has developed a Speed Nut for use on electrical terminal boards in connecting capacitors and resistors. U-portion of nut slips over board, and a screw is run down through to anchor wires in place, one at a time. Any lead can be removed without disturbing others.—Prod Eng, May, 162

ELECTRONIC ORGAN

Key-board on new organ has contacts under keys to control individual vacuum-tube oscillators. Each note corresponds to a Hartley oscillator arranged to provide a sinusoidal fundamental devoid of harmonics and a pulse signal rich in harmonics. Mixer circuits, buffer amplifiers, volume control, and separate loudspeaker channels complete sound generation. Power amplifiers have low intermodulation distortion.—Electronics, May, 11

Timbering Machine — Tractor-type machine mounting a hydraulically controlled boom for lifting and holding crossbars against roof as posts are cut, announced by Baker-Raulang Co., operates in high- or low-seam, trackless mines. Posts are moved from trailer over top of machine on rollers to boom saddle. Boom swings 90° either side of center.—Coal Age, May, 194

Amplifies Strain—Brush Development Co. model BL-310 amplifier, when used with company's oscillograph, forms packaged unit to measure strain. Equipment records static or dynamic strains up to 100 cps. and their direction as well as magnitude.—Elec World, Ap 24, 122

Solders Alloys—Alpha Metals Co., Inc., has developed an acid-core solder for use on stainless steel, Monel, nickel, and other metals. The three-core solder uses synthetic acid, claimed to be more active as a flux and only half as corrosive as zinc chloride.—Aviation Wk, May 10, 32

Winch-fitted Pallet Truck—Loads up to tons can be handled by Lyon-Raymond Corp.'s winch- and ramp-equipped hydraulic lift truck. A 15-ft. steel cable pulls crates onto truck. Lowered height is 3¼ in.—Factory, May, 142

Automatic Welding Press—Introduced by E. W. Bliss Co., the press is for high-speed assembly of large metal sections. Assembled parts on the lower die are raised to the upper die having welding tips positioned properly. Limit switches stop the slide in correct position, perform welds, and then lower slide. Press capacities are 78x38 or 69x29 in. in bed size.—Am Mach, May 20, 144

Saves Brakes—When car ignition key is turned, an amber signal light on dash panel lights to tell driver that hand brake is applied. Releasing brake breaks circuit. The Techtmann Industries circuit is easily installed.—Am Auto, May, 54

Cutter Dices Plastics—Precision dicing cutter, developed by Taylor-Stiles & Co., produces uniform ⅛-in. cubes of plastic materials from continuous sheet, ⅛-in. thick and 15-in. wide. Speed ranges up to 75 lin. ft. per min.—Chem Eng, May, 154

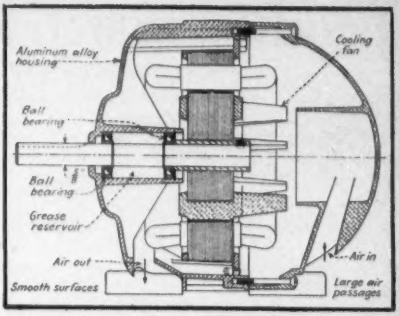
Industrial Spotlight—Powerful enough to illuminate welding work when viewed through a No. 10 welder's glass, the light allows welder to see the work before striking the arc. It uses 6-v., sealed-beam lamp rated at 30 watts at 115 v., 60 cycles. Offered by Westinghouse Electric Corp., spotlight weighs 5 lb.—Power, May, 122

Wrapper Adjusts for Size—An overwrapping machine, developed by Howard Eng. Co., wraps packages of 1 to 20 different sizes at rates of 1,200-1,800 per hr. Size adjustment is simply made. A heat-sealing device is controlled by thermostat.—Food Ind, May, 166

Applies Curing Compound—Concrete curing membrane is applied by a new spraying machine which rides atop side forms. Each square foot is sprayed twice. Controls are automatic. The Flex-Plane Co. machine is available in 10-25 ft. widths.—Cons Meth, May, 120

Cartridge Drives Stud—The Velocity-Power driver, made by Mine Safety Appliances Co., uses a blank cartridge as power source. Designed to drive steel studs into structural steel plate up to ¾ in. thick or through ⅜-in. plate into concrete, it operates silently, without flash or recoil.—Prod Eng, May, 99

Puffed-shale Building Blocks—Concrete building blocks, produced from exploded shale, are lighter and serve as better insulators because of entrapped air. Blocks were developed by Bric-Bloc, Inc. Engineers report an 8-in. block gives insulation equal to that of a standard 12-in. block.—Business Wk, May 22, 60



ALUMINUM-HOUSED MOTOR

One-piece, permanent-mold cast, aluminum alloy housing is featured on electric motors by Electra Motors, Inc. End shield, bolted on one end of housing, and rotor core are also cast aluminum, making total weight of ½-hp. motor only 19½ lb. Rotor shaft is cantilever mounted in ball bearings in motor housing. Cavity between bearings is filled with grease for permanent lubrication.—Prod Eng, May, 101

Dry Blueprinting—A dry process reproduction unit consisting of continuous print and Ammo-Fume dry developer has been announced by Peck & Harvey. Dry prints, positives and negatives, the former with black, red, blue, yellow or sepia lines, are made on material sensitized to ammonia fumes.—Elec World, May 15, 29

Mine Cable Visible in Dark—A yellow cable that can be seen in dark mines has been developed by U. S. Rubber Co. It is available in various sizes for use on various mining machines.—Coal Age, May, 192

Breaks Pavement—Pavement up to 10 in. thick is broken and back-fill tamped by a new breaker developed by R. P. R. Corp. The tricycle-mounted unit delivers 55-60 blows per min. at 5,000 ft.-lb. Normal stroke is 24 in.—Eng News-Rec, May 13, 118

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Food Research Advances

Results of research program are important to food processors as they point to process improvement, quality retention, and efficient use of byproducts

EXTENSIVE RESEARCH in 1947 by U. S. Bureau of Agriculture and Industrial Chemistry will result in many improvements in food processing.

Among the projects was development of special procedures for wet-milling of soft, moldy, and heat-damaged corn. Particular attention was given to the steeping operation, which softens the corn and allows separation of starch, germ, and protein fractions. It was found that a sulphurous-acid steep breaks down and disperses protein according to acid concentration and length of steeping period.

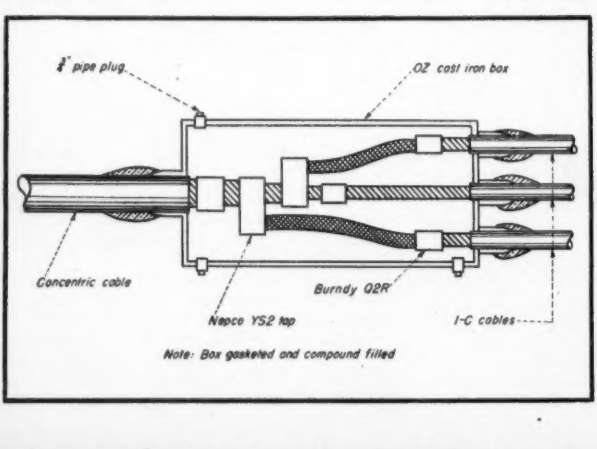
Research also has put waste material from pear and asparagus processing to work. Pear waste makes a good nutrient for yeast feeds. Cannery waste from pears is 96,000 tons yearly. Converted to yeast, it would yield 3,000 tons of concentrated feed worth $600,000.

It was found that a concentrated juice prepared from waste asparagus butts made an execellent medium for growing useful microorganisms. The process is commercially feasible.

Studies on protection of lard and other fats against rancidity showed that use of lauryl gallate is promising. It has excellent anti-oxidant properties, and its protective action is carried over into baked goods, except when bicarbonate of soda is added.

Color of canned freestone peaches was improved by newly developed processing methods. These methods provide for removal of gases entrapped within the fruit tissue and reduce to a minimum the discoloration by oxidation during processing. Also, it was found that tree-ripened fruit was no more flavorful or nutritious than fruit harvested when less mature and softened in storage.

Other research demonstrated that peas and apples can be dehydro-freezed without impairment of quality. The process includes partial dehydration to remove most of the moisture, followed by quick freezing. Storage, transportation and handling costs are reduced by decreasing weight and volume of food before freezing. Maximum weight reduction for peas and apples appears to be



TAILORED POWER

Ultra-modern geophysical laboratory of Shell Oil Co. at Houston, Tex., has electrical system tailored to fit needs of geophysical research. One outstanding feature is concentric cable distribution wherein interference effects are reduced by its low inductance from minimum spacing between conductors. Service feeders are spliced outside to 4-conductor concentric cable, outer copper layer serving as neutral. — Elec C&M, May, 65

50% without appreciable loss in quality.

Studies indicated that soft rot of oranges may cause bacterial contamination in frozen orange juice. Other work on citrus products produced firm grapefruit segments, heat-treated with a calcium chloride added as a firming agent.

It was found too that frozen fruits may be safely packed in hermetically sealed containers without fear of *Cl. botulinum* poison develpment. If this finding is confirmed, it may revolutionize packing procedures for frozen foods.—Food Ind, May, 110, 113

Aircraft Industry Adopts Standards in Aluminum

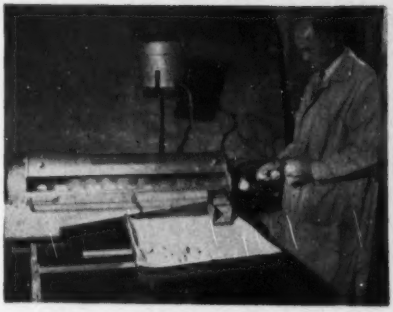
West Coast aircraft manufacturers will work from a new "Warehouse Stock List," developed by the National Aircraft Standards Committee to simplify design and materials ordering. In aluminum sheeting, for instance, one 48x144-in. sheet in one finish will be standard instead of three or four sizes and finishes. One size, finish, and temper of tubing will be used instead of eight. Diameter and wall-thickness of tubing are standardized.

Northrup Aircraft, Inc., has reduced the number of stockroom items 40% below last year, as standardization has made ordering faster and more certain. The committee will revise the list continuously and is preparing a list to cover brass and copper items.—Business Wk, May 8, 56

Improve Liquid Rheostats

Notable for stepless-speed control, liquid rheostats have been improved to provide maximum dependability with minimum maintenance. A dilute solution of sodium carbonate has proved a satisfactory electrolyte at low cost and little or no corrosion.

Modern construction has individual cells for both open-cell and closed-cell designs in a common tank. This equalizes temperatures in all phases and provides high thermal-storage capacity. Open-cell design is suggested for constant-torque loads, whereas closed-cell construction is for centrifugal-fan and compressor loads where high resistance per phase is required.—Power, M, 80



EGG CLEANER

Better-looking and longer-lasting eggs come from this cleaner, expected soon to be available commercially. Cornell University Research Foundation has patent rights. Eggs are cleaned by power-driven abrasive disks moistened with hot water, and then are dried by blast of electrically heated air.—Elec World, May 8, 120

Catalytic Gas Reforming

Catalytic reforming of intermediate hydrocarbons into a gas suitable for utility distribution is now commercially done at the Long Island Lighting Co. Riverhead plant. Unit was developed by Surface Combustion Co.

The plant uses alloy tubes filled with a refractory-supported catalyst and connected to a system that feeds mixture of hydrocarbon vapor, steam, and air. This mixture, rising through the bed, dissociates the vapor into H_2 and CO to form a 240-Btu. gas of 0.54 gravity.

The hot gas is cooled and enriched by further addition of hydrocarbon vapor to 540 Btu. and 0.67 gravity.—Chem Eng, May, 208

Airfoil Fuselage Proven In Cold-Weather Tests

Built by Cancargo Aircraft Mfg. Co., Ltd., the *Loadmaster* has proved highly successful as a cargo freighter in northern operations. Plane uses an airfoil fuselage section to provide much of the lift; it also increased cargo capacity. As a cargo ship, it can carry 2,070 cu. ft. or 11,500 lb. and, as a passenger plane, can accommodate 24 passengers and 546 cu. ft. of cargo.

Span is 86 ft., length 54½ ft., body width 20 ft., and length 30 ft. Side fuselage hatches are 70½ x 41 in. and rear hatch is 6 x 7 ft. Two Pratt & Whitney engines give a maximum speed of 235 mph., 193-mph. cruising speed; plane lands at 74 mph. Range is 2,700 miles as a cargo plane, but is cut to 1,320 miles as a passenger plane.

Structural strength is derived from a series of bulkheads throughout fuselage section, absorbing primary and secondary air frame loads. With this construction, higher payloads are possible. Dual wheels, excellent for operation on packed snow or undeveloped fields, retract into wells accessible from cockpit. This permits minor adjustments to hydraulic system while in flight.—Aviation Wk, Ap 26, 28

New Petroleum Technology

Silica-magnesia, a new catalyst for oil refining, promises a 25% increase in oil yield according to Esso Standard Oil Co. It is a combination of magnesia and white sand. The resulting gasoline is not of high quality but can be mixed with higher quality gas. The catalyst is in commercial production; full-scale cracking equipment will be in production soon.

Polyisolutylene, an oil-refining byproduct, can be used for a wide variety of products. Among them, say Standard Oil of Indiana officials, are: rubber, machine grease, cosmetics, plastic adhesive tape, electrical insulation, dripless oil for textile machinery, corrosion-resistant paints, grafting wax for trees, and a chemical agent to improve diesel fuels. —Business Wk, M 1, 46

Damped Quill Stops Self-Excited Chatter

Chatter, preventing precision machining and good surface finish, may be caused by self-excited vibration building up in quills or boring bars. The Heald Machine Co., to avoid this cause, has developed an inertia-damped quill.

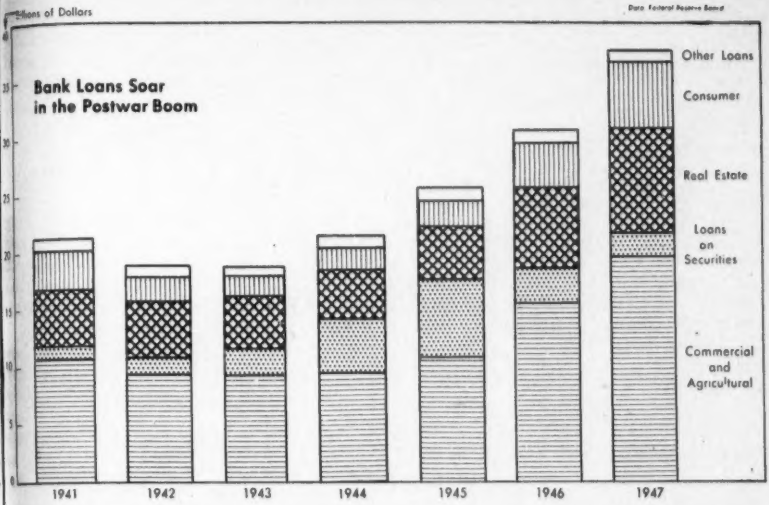
The unsupported outer end of the quill is bored out and a plug of heavy material inserted. The plug is slightly smaller, leaving a clearance of about 0.003 in. on a ¾- to 1¼-in. quill, so it floats in the bore. When quill starts to vibrate, the plug tends to remain stationary because of its inertia.

Air in the clearance space cushions the relative motion between plug and quill. It also dissipates vibration energy before it can build up to any sizeable value.—Am Mach, M 6, 93

Renew Concrete-Block Houses

Mortar-joint deterioration, caused by water seepage between concrete blocks in 31 two-story Cleveland apartment houses, was curbed by a spray-applied mastic-cement coating. A crew of three can finish 2,800 sq. ft. per day, saving 50% in time over brush application.

All dust and loose concrete was removed from joints and faces by wire brush. Joints then were primed with water-repellent, oil-base compound applied by brush, and the joints filled with an asbestos-fiber, oil-base calking compound. One gallon of the mastic-cement covered 25 sq. ft. One man prepared surfaces, calked joints, and masked adjoining surfaces; a second crewman filled and maintained supply tanks; third man sprayed on coating.—Eng News-Rec, Ap 29, 88



BANKING — TODAY, TOMORROW

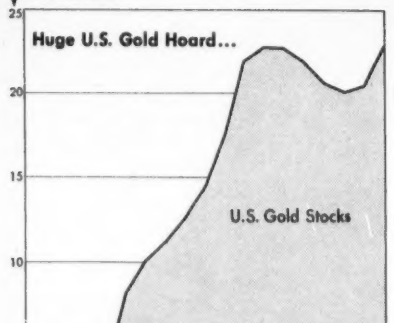
—*Report to Management*—

U. S. Banking system today is more secure than it has been at any time in its long history. Loans and deposits have soared since prewar days. Federal Deposit Insurance Corp. is given credit for stabilization. Economists see dangers in present system, but do not expect a banking collapse similar to 1933.

UNITED STATES banks have grown more rapidly, gone through more changes, and become more secure in the last 15 years than they did in the first 150 years of their existence. American banking's blackest days came in March 1933, when, after 150 years of growth, the system went "bust." Since then bankers and the government have been building a system that would withstand business fluctuation—a system that would serve the financial needs of our growing economy and would not go to pieces periodically. Mixed with the banking problem always has been the problem of the business cycle. Banking panics in 1893 and 1907 hurt business. The business depression in 1920 hurt banking. Then in 1933 business and banking went down together—neither could rise without the other.

Since the crash, the banking system has improved markedly. By the end of the war, U. S. banking was in its strongest position in history. Since then banks have continued to expand. Deposits in commercial banks now are four times what they were in 1933. In two years, they have added $12-billion to their loans.

In recent years, most banks have had to resist the temptation of either undertaking a happy-go-lucky expansion of commercial banking (such as that preceding the 1933 collapse) or evolving



into a form of investment trust, with secure investments and only a mild interest in the desires of business borrowers. In avoiding these twin temptations, the U. S. banking system has been strengthened. Today it is one of the few in the world not nationalized—or on the brink of nationalization. Increased government control in recent years is not indicative of nationalization.

This impressive record of the past two years does not guarantee that all banks will continue in their present happy position. While the postwar boom lasts, most loans are safe loans. The test will come when business activity starts to ease off. Then only expert management can steer a safe course and still stick largely to commercial banking.

Some bankers are worried that too large a proportion of outstanding loans cannot withstand a business slump. High break-even points render many clients easily vulnerable to a relatively small decline in sales. It may be then that the exceptional vitality shown by the banks since the war's end has been achieved at the expense of at least part of its liquidity.

The problem of controlling bank cred has become more complex in recent year The rise in the federal debt (finance largely by the banks) expanded ban holdings of government securities an increased deposits 400%. At the sam time the whole relation of commerci banks to the government has changed.

Today bankers in the U. S. ponder tw questions of critical importance:

(1) Can the present system be caught by a condition similar to that of 1933?

(2) What is the role of U. S. banks in our future economy?

Before examining these let us look the significant changes that have take place in the last 15 years.

Unit Banking System

In one respect the system has n changed. It is still a unit banking sy tem. In the main—notable exceptio being Bank of America, California—t independent, single-office bank is typ cal. In this respect American bankin system differs from systems in oth countries where branch banking is t rule not the exception. For instanc in England, five banking houses a their branches and the Bank of Engla largely dominate the country's financ life.

Since 1921, when there were abo 30,000 commercial banks operating this country, the number of banks h decreased. In 1929 there were 24,0 after the crash 14,400 were operati Today only 14,186 are in operation. T rapid drop in the twenties showed weakness in the system. Between 19 and 1934, 14,800 ceased operation—m of them going into receivership. Sin the end of 1933 only 336 suspensions h taken place—1944 and 1947 seeing o two failures, 1945 and 1946 show none.

More significant than this drop number is the change in the size composition of bank asset portfolios.

In June 1929, total loans and inv

nts of commercial banks were $49.4-illion. Government securities totalled st under $5-billion; other securities talled $8.7-billion. Loans were then 5.7-billion, 72% of the asset portfolio's tal earning power. In June 1933, earn-g assets dropped 40% to $30.4-billion, ost of the decline coming from contrac-on of loans. Government securities were p to $7.5-billion but other securities pped to $6.5-billion.

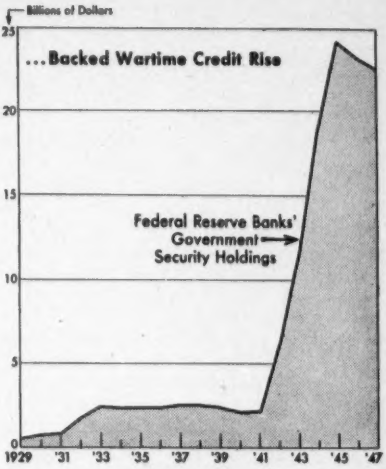
As 1948 opened, the bank portfolio icture was: total loans and investments, 116.7-billion. Of this, some 55% ($64.2-billion) were government bonds. Business loans were $38.4-billion, only 2.7-billion above 1929. Other securities talled $9-billion. Thus government eficit financing had layered an immense olume of government securities into the ystem. These have become the banks' ost important assets. Return on overnment securities now represents ver one-third of all bank earnings.

Symptom of Inflation

In one sense, the growth of deposits is symptom of general inflation of the conomy. But from another viewpoint, he addition to the money supply has een an indispensable support of the nflation. Without the enlarged supply f banking money, higher prices would ave been impossible.

Capital funds of banks have not kept ace with the growth of assets and de-osits. The result is a decline in capital atios. No longer do bankers follow the ne-to-ten ratio of capital to deposits; apital funds are nearer 7%, many anks below that figure.

The large government securities hold-gs have introduced new standards of ank management. Since government ecurities were "riskless assets," banks ave been able to ignore the capital-to-eposit rule of thumb. Most banks now re appraised in terms of the ratio of apital to "risk assets." On this basis, he banking system looks good in com-arison with the prewar period, but it is



losing ground. Capital accounts are the weakest part of the banking picture now.

One of the strengths behind the current banking system is the Federal Deposit Insurance Corp., established in 1933 after the crash. It guarantees all deposits up to $5,000 in member banks. Member banks are assessed one-twelfth of one percent on the average deposits of member banks to cover this insurance. All but 800 small commercial banks in the U. S. are members. Since 1934 fewer than 250 insured banks have gone into receivership.

FDIC's losses and expenses have been far less than its income. One reason is that banks that were hurt in 1933 have been more cautious. Also important is the confidence in the safety in banking that the FDIC has engendered. Some bankers feel FDIC is yet to prove itself. The test will come, they say, if a drastic shrinkage in our credit structure should appear—a contingency which no one now expects.

The FDIC is working on an extremely slender margin if it be compared with any other type of insurance. Currently it is still paying back its $28.9-million

starting capital to the government. At a maximum it will have a reserve of $1-billion and a borrowing power of $3-billion. Yet deposits insured at the end of 1947 totalled $154-billion. On the surface this situation appears very risky. But member banks hold $114-billion in cash and government securities. If all their loans and corporate securities went bad, 75¢ on the dollar could be paid. Another bulwark to the system is that the federal government almost certainly would give the organization more money if mass-failure occurred.

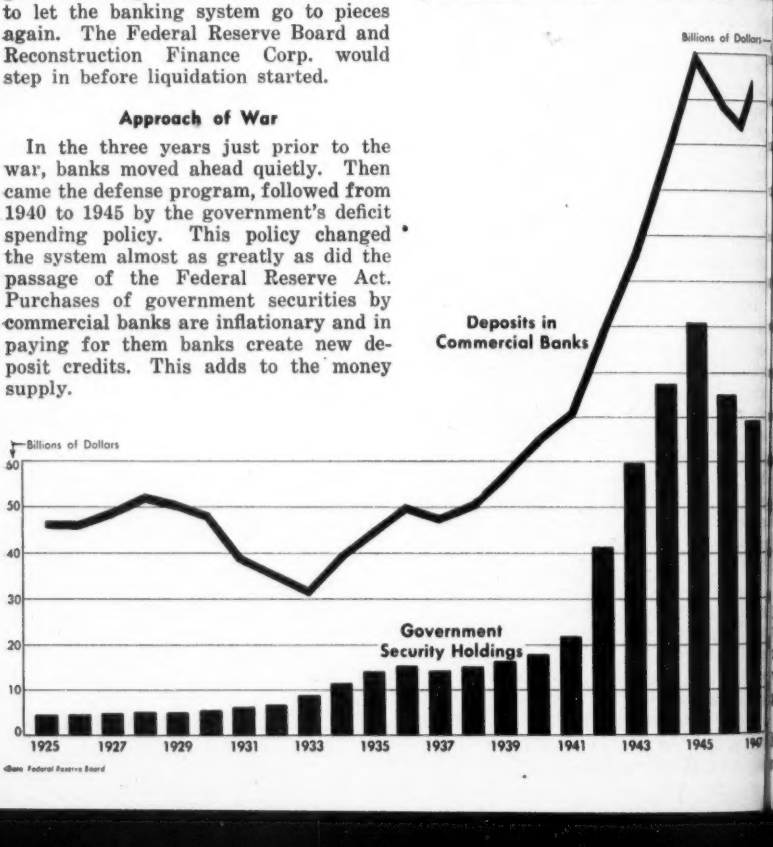
Finally, and most important, various government agencies are determined not to let the banking system go to pieces again. The Federal Reserve Board and Reconstruction Finance Corp. would step in before liquidation started.

Approach of War

In the three years just prior to the war, banks moved ahead quietly. Then came the defense program, followed from 1940 to 1945 by the government's deficit spending policy. This policy changed the system almost as greatly as did the passage of the Federal Reserve Act. Purchases of government securities by commercial banks are inflationary and in paying for them banks create new deposit credits. This adds to the money supply.

The Treasury recognized this an tried to minimize the inflationary effect of its deficits by selling all the securitie it could to private individuals, life insur ance companies, mutual saving bank and other investors. But proceeds fe short of covering wartime deficits. Th Treasury turned to commercial bank

The Treasury and Federal Reserv Board announced early in the war tha banks would be provided additional re serves as war financing progressed. Th banks agreed readily to invest these i government securities. Their holding increased from $16.3-billion in 1939 t $90.6-billion in 1945. Over the sam



Data: Federal Reserve Board

period, deposits jumped from $57.7-billion to $150.2-billion.

The Reserve Bank not only funished the necessary added reserves. It went even further. It promised to support government obligations on the market at par. Still later it was committed to maintain 2½% on long-term bonds.

Good for Bond Selling

As a bond-selling device, the support policy worked wonders, but at the war's end it began to develop some embarrassing features as the fight against inflation began. Commercial banks began to "reach out" for longer-term, higher-yielding bonds. They sold short term obligations and with that bought long-term bonds from private investors. This had the effect of monetizing that part of the debt held by the public. The Reserve system soon found itself having to buy all short-term securities not finding private takers.

At the same time, banks were able to expand private commercial loans at will. There was no need to worry about reserves because they could always sell government securities.

In such a situation the Reserve Banks have not been able to use standard methods of restraining bank credit to check inflation. The government securities held by banks have in reality become excess reserves. Some bankers say the answer lies in scrapping the support policy. The only way to stop inflation, they say, is to stop expansion of the money supply. This means higher interest rates—which in turn involves a lower price for government bonds now outstanding.

Such a course poses several tough problems for the Treasury. It might have to pay more for debt service if interest rates went up; moreover, it doesn't know what the public response might be if government bonds went below par.

Since war's end, monetary authorities have sought a safe way to put a check on money supply. One method has been through debt reduction. At the end of 1945 the national debt was $278-billion—almost $200-billion being marketable public issues. This has been reduced in two ways. First, large cash balances built up in the general fund were used to redeem bonds; and secondly, the government's cash surplus from its current budget has been used for debt reduction. Today the debt has fallen to $254-billion, $163-billion being marketable public issue.

The debt retirement has put a brake on monetary expansion. In '46 and early '47, deposits actually decreased about $15-billion. But by the end of '47 expansion of loans to business had more than offset the effects of debt retirement.

In the fall of 1947, Reserve Banks were supporting government bonds at prices two or three points above par. But by late December pegs were dropped to just over par. This sudden drop was one of the worst shocks to the money market in recent years. For commercial banks, the effects were sobering. Most banks had purchased government securities at a premium so, when prices dropped to par, these banks took a paper loss.

If banks hold these securities till maturity date they can amortize the premium against income and get the yield figured on. If they sell before maturity they must take a paper loss. This fact has forced many banks to hold the bonds instead of selling them and using the income to make more loans to business. But such measures are only extemporizing. The truth is that the Reserve Board no longer has the credit control it formerly possessed.

Future of Banking

With this background in mind, we can draw some conclusions about the future of the U. S. banking system. Conclusions are tentative at best.

First, there is practically no possibility of a future bank collapse similar to 1933. There may be some failures but

the number will not increase sharply, particularly in the next few years. Barring bad management, there should never be another U. S. bank panic.

Second, banks are stronger and more liquid than ever before the war. FDIC has generated confidence. Reserve Banks have the ability to keep the system liquid by loans and advances or by buying government bonds.

No Gold Panic Possible

A gold panic can not occur as gold does not circulate freely. Theoretically, Reserve Banks must maintain a gold reserve of 25% against notes and deposits. That reserve now approximates 50%.

Total volume of bank deposits should fluctuate much less widely, percentagewise, in the future.

The $76-billion in government securities held by banks form a stable base for the entire bank asset structure and will not be extinguished as commercial loans are in times of deflation. Deposits corresponding to this amount are thus secure. They provide a stable volume of earnings for the banks.

It is probable that bank investment in government securities will move contracyclically—in bad time the government may run at a deficit and increase the supply of securities and in good times retire its debt. This would offset variations in commercial loans.

In this respect the entire banking and credit structure is better off than it ever has been. Tightening up of bank credit is often one of the causes of depression. This could happen but it is less likely to happen than before and if it should happen, results will be less serious.

But the change is not all for the good. While the banking system is less likely to contribute to a depression, it is more likely to add to inflation. No satisfactory methods have been devised to combat expansion of commercial loans. The big monetary problem could become in the future not the prevention of depression, but avoidance of the consequences of over-easy money.

Another problem may have to be faced. Who will be bank customers over the long pull. At the moment there is wide demand for commercial bank credit. But historically, business has been trying to get away from the use of short-term accommodations. It wants to use its own money, or longer-term credit. Demands from banks someday may become chiefly those for equity credit. The trend is now toward making more loans of this character.

One other type of new banking business should be mentioned—loans to consumers to buy goods on installment. Before the war, banks handled very little of this business. Today they are going after all they can get.

If War Comes . . .?

All of these conclusions are based on the premise that no war or armament program sufficiently large to force the government into deficit spending is imminent. No one can guess what effect another war would have on our banking system. Banks might become nationalized. They might acquire large blocks of no-interest Treasury obligations instead of interest-bearing securities that were sold during the past war.

One certainty is that all else would be subordinated to a Treasury financing program. Commercial business with banks would dip, as war contractors could borrow money directly from the government. Banks would again have to do what they were told, buy whatever securities were offered, and accept whatever return the Treasury established.—Business Wk, May 8, 73

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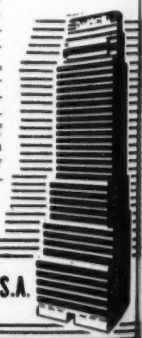

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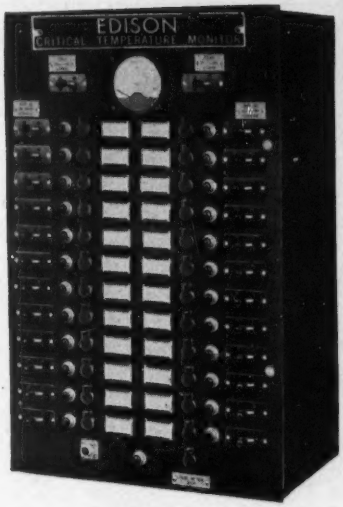

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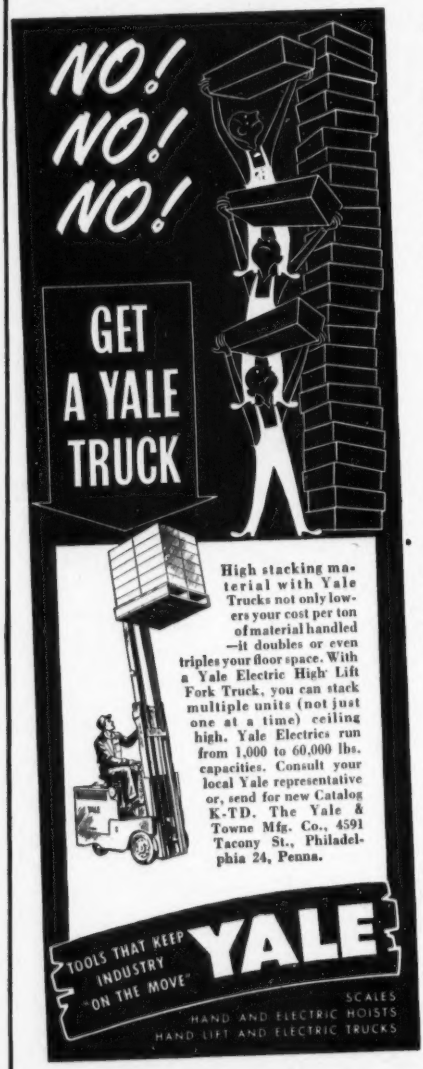
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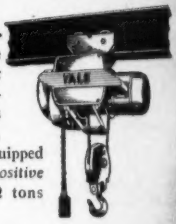

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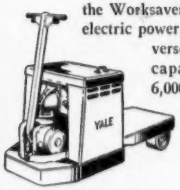

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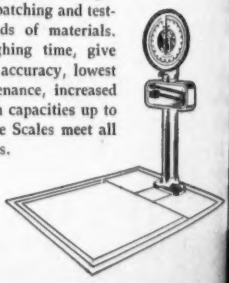
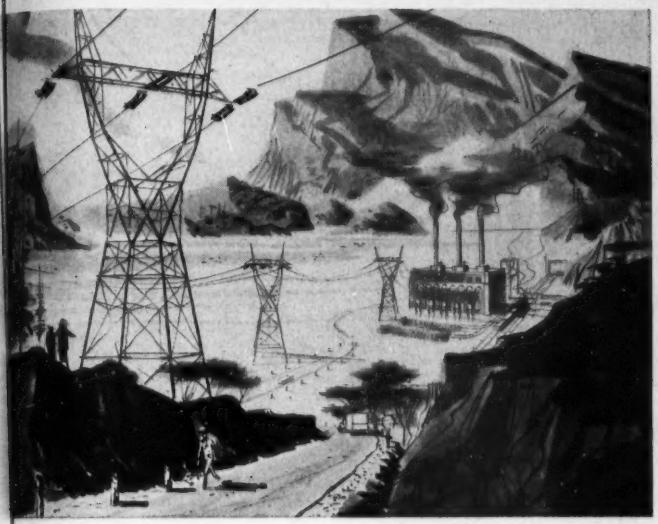


YALE OFFERS NEW SCALE LINE—The Load Kings, for the weighing, counting, batching and testing of all kinds of materials. They cut weighing time, give you prolonged accuracy, lowest possible maintenance, increased scale life. With capacities up to 60,000 lbs. Yale Scales meet all industrial needs.

ALLIS-CHALMERS

WORLD'S LARGEST LINE OF MAJOR INDUSTRIAL EQUIPMENT



Lifeline for Industrial Progress!

THE POWER LINES supported by these steel towers start at that building down in the valley. If you could look inside the building, you would see huge steam turbo-generating units developing electric power for many factories and homes.

This power plant exemplifies how science and machinery aid world industrial growth, contribute to good living for more people.

It illustrates, too, Allis-Chalmers' wide range of industrial products. We build turbines and generators to make electricity—motors, machines and equipment to use it. Hundreds of products marked "A-C" are helping in power generation, construction, sugar refining, flour milling, steel making . . . in *every* basic industry.

For *your* industrial equipment needs, do as many others do—consult our representative or distributor in your country.

ALLIS-CHALMERS MANUFACTURING CO.
General Machinery Division
Milwaukee 1, Wisconsin, U. S. A.

Electrical Equipment

Steam, Hydraulic Generating Units, Condensers

Crushing, Cement and Mining Machinery

Centrifugal Pumps

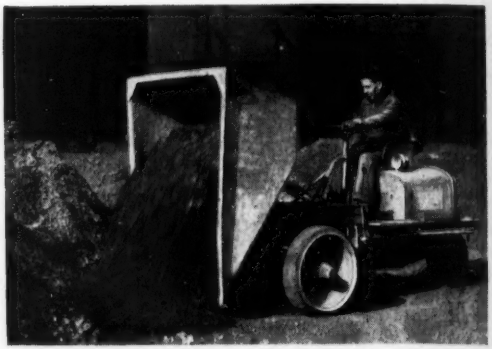
Flour and Sawmill Equipment

Serving All Industry FOR MORE THAN A CENTURY

STILL GOING STRONG

after 25 busy years!

CLARK



"Our Clark Tructractors have been in steady operation for 25 years and are still in very good condition"—says

Cranford C. Blount, Secretary
CRANFORD COMPANY, INC.
Brooklyn

Records of this kind are no surprise to the men who build Clark Tructractors, Fork Trucks and Towing Tractors.

All Clark's wealth of experience in solving material handling problems is quickly at your service through a world-wide organization of competent men. Consult Clark.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

CLARK EQUIPMENT COMPANY • EXPORT DIVISION
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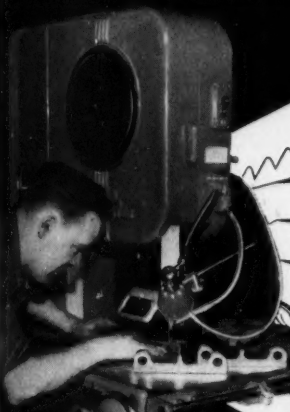
OTHER PLANTS—BUCHANAN, JACKSON, BERRIEN SPRINGS, MICHIGAN
DISTRIBUTORS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

YOU CAN *Band Saw* ANYTHING *with* DoALL *machines and blades*



IRON, STEEL, ETC.

WOOD, PLASTICS, ETC.

RUBBER, ETC.

ALUMINUM, COPPER, ETC.

PAPER, CLOTH, ETC.

WOOD, PLASTICS

HARD STEEL, ALLOYS, ETC.

MEAT, BONE, FISH, ETC.

EVERY TYPE OF MATERIAL . . .

whether it is sticky, soft, spongy, tough or brittle can be bandsawed quickly and economically on DoALL machines and specially developed saw blades. You can slice intricate shapes from stock in minutes – instead of the days it would take with time-wasting, chip-cutting methods. This is the world's fastest stock-removing process. Makes straight, curved, external, or internal cuts at any angle. Sawing is continuous – no wasted backstroke. Smooth surplus power and infinitely variable speeds assures accuracy and smooth finish. Investigate great savings possible!

OTHER DoALL PRODUCTS
Band and Jig-Filing Machines; Surface Grinders; Milling Machines; Punch Presses; Lathes; Saw Welders; Heat-Treating Units; Precision Inspection Equipment; Electronic Sorting Units

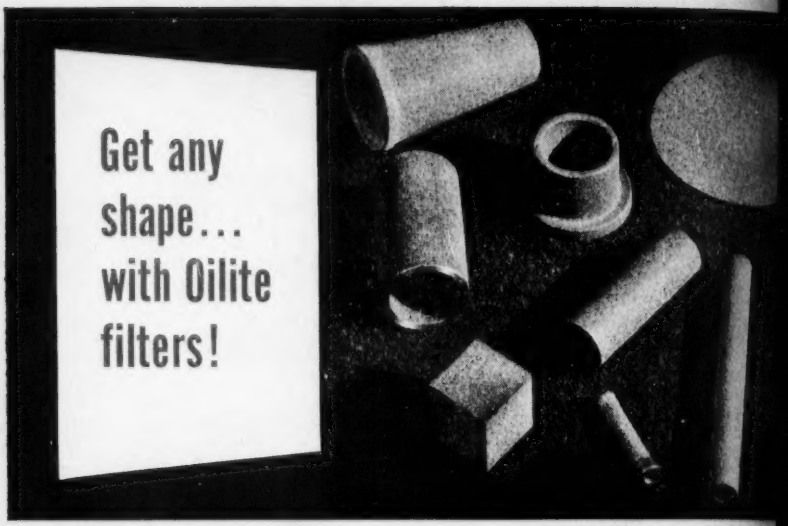
The DoALL *Company*

REPRESENTATIVES IN 56 COUNTRIES

DoALL STORES IN KEY CITIES

Des Plaines, Illinois, U. S. A.

Cable Address: DoALL, Des Plaines



Plates, tubes, cylinders or cones—almost any filter design can now be made for you *at low cost* the Oilite way!

This new economy is made possible by an altogether different method of filter manufacture. Oilite filters and screens are *pressed* into shape . . . made from a special *powder* of bronze, brass, copper, iron or other metals and alloys. You pay for no expensive machining, no wasted material!

You can also enjoy the money-saving advantages of Oilite in bearings and machine parts. Cored and bar stock, strip and plate stock are available, too. One of the many Oilite products may be just what you need to solve your production or maintenance problems. Write today for details.

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POWDERED METAL
PRODUCTS